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CLEAN WATER - REPORT TO CONGRESS - 1973

ENVIRONMENTAL PROTECTION AGENCY

MAY 1973

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clean water

REPORT TO CONGRESS-1973

U. S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D. C. 20460
May 1973

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ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
May 31, 1973

OFFICE OF THE
ADMINISTRATOR

Dear Mr. President:
Dear Mr. Speaker:

I am pleased to transmit to the Congress, as required by Section 516(a) of the Federal Water Pollution Control Act, the first of a series of annual reports covering measures taken to implement the objectives of the Act.

The scope of this first report for calendar year 1972 is restricted—essentially it is confined to the nine subject areas listed in Section 516(a).

Future reports of the series are expected to be more comprehensive in scope and balanced in presentation. They will include coverage of water quality required by Section 104(a)(5) and sewage flow reduction required by Section 104(o)(2).

Sincerely,

Robert W. Fri
(Acting) Administrator

Honorable Spiro T. Agnew
President of the Senate
Washington, D.C. 20510

Honorable Carl B. Albert
Speaker of the House of Representatives
Washington, D.C. 20510

CONTENTS

	Page
I. Introduction	1
II. Water Quality Planning and Surveillance	7
The Planning Approach	7
Statewide Water Quality Planning	7
Areawide Waste Treatment Management Planning	9
Planning for Construction of Treatment Works	10
Water Quality Surveillance	10
Planning Problems and Status	11
III. Water Quality Research	13
Processes and Effects	13
Control Technology	15
Implementation Research	16
IV. Development of Industrial Effluent Limitations	19
Guideline Development	19
V. Federal Enforcement	25
Federal Enforcement Procedures before the 1972 Amendments	25
Enforcement Procedures under the 1972 Amendments	27
VI. State and Local Water Pollution Control Programs	31
State Program Grants	31
Municipal Waste Water Treatment Works Grants	33
Role of the States	37
VII. Efficiency of Treatment Works	43
Procedures for Accomplishment	43
Data Analysis	43
General Problems	46
Status	47
VIII. Manpower Programs	49
Manpower Planning	49
Manpower Training	49
Estimate of Manpower Needs	50
IX. Water Pollution Control Advisory Board	51
Animal Wastes	51
Land Use	51
Ocean Disposal	51

I. Introduction

The Nation's policies for the achievement of water quality suitable for many purposes have evolved through six legislative enactments since the passage in 1948 of the initial Water Pollution Control Act. The evolution of our water quality laws has brought with it the development of a wide range of related activities in financial and technical assistance, research, planning, and regulation. A brief overview of the development of Federal water quality law is given below.

1948 ACT

Before 1948, Federal law relating to water pollution was applied only to the specific concerns of navigation, disease, and oil discharges in the territorial sea and other tidal navigable waters. It is interesting to note, however, that one early law, the Refuse Act of 1899, was later used as a water pollution abatement instrument, particularly in the years 1970-72.

The 1948 act recognized the primary rights and responsibilities of the States in water pollution control, and this position is still the congressional policy in present law. The initial act provided for comprehensive water pollution control programs, research, financial assistance to States, municipalities, and interstate agencies for waste treatment facilities. Also included was a program of construction loans and preliminary planning grants that were never implemented because the funds were not appropriated. The act authorized abatement of interstate pollution of interstate waters through Federal court suits after two notifications to the discharger and a public hearing. The requirement that the offending State consent to the suit inhibited effective enforcement. Only one hearing was held and no suits were brought. The act's 5-year authorizations were extended for another 3 years to 1956, when the first permanent law was enacted.

1956 ACT

Provisions of the 1956 act are outlined below; the law

- gave impetus to municipal waste treatment by authorizing Federal construction grants;
- strengthened the research function of the law including research grants, fellowships, and technical training;
- authorized the collection and dissemination of basic water quality data;
- authorized grants for the establishment and maintenance of adequate State water pollution control programs;
- continued the authority for comprehensive programs, technical assistance, and interstate cooperation; and
- established a three-step enforcement procedure (a Federal-State conference, a public hearing, and Federal court suit) in the case of interstate pollution of interstate waters endangering the health or welfare of persons. (State consent to a suit in such a case was not required.)

1961 AMENDMENTS

In 1961, the enforcement authority was extended to navigable as well as interstate waters and was applied to cases of the intrastate pollution of such waters on request of a Governor. Further, the term "interstate waters" was redefined to include coastal waters. These steps greatly expanded the scope of the law. The authorization for construction grants for waste treatment works was increased and extended, the dollar ceiling was increased, and a higher ceiling was fixed for joint projects as an incentive to inter-community cooperation. Research was stepped up and regional laboratories were authorized. The program grant authorization was increased and extended. The use of water storage in Federal reservoirs for low-flow aug-

mentation to improve water quality was fixed in law, but not as a substitute for adequate treatment or other waste control at the source.

1965 AMENDMENTS

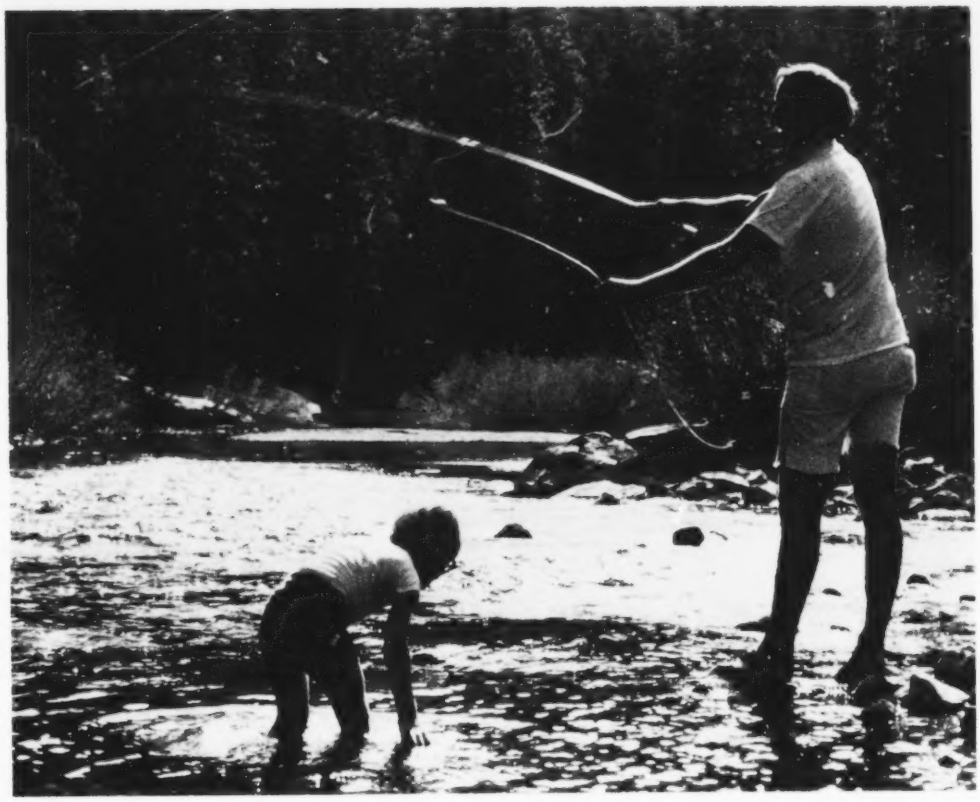
The 1965 law provided for the establishment, revision, and enforcement of water quality standards for the Nation's interstate waters. The standards, consisting of water quality criteria, were designed to provide water of proper quality for a range of designated uses. A plan of implementation and enforcement was to be prepared in conjunction with the standards. The States were given the first opportunity to adopt standards subject to Federal approval. Research and demonstration projects addressed to the difficult problem of storm sewer and combined storm-sanitary sewer wastes were authorized. Additional grant funds for waste treatment works were authorized under conditions that were beneficial to populous areas and conducive to State participation in project financing. A 10-percent increase in the amount of a grant was authorized for projects conforming with comprehensive metropolitan area plans. In certain cases of pollution injurious to the shellfish industry, the amendments authorized enforcement action on Federal initiative, whether or not the pollution was interstate in effect. The organizational placement of the national program was elevated with the creation of the Federal Water Pollution Control Administration (the agency was transferred from HEW to Interior in 1966, and its functions were transferred to EPA in 1970).

1966 AMENDMENTS

The principal thrust of the 1966 act was the expansion and redirection of the grant program for construction of waste treatment works. It was extended for 4 years, with authorizations increasing from $450 million in fiscal year 1968 to $1.25 billion in fiscal year 1971. (Appropriations in the first 2 years, particularly, fell far short of the authorization, however.) Dollar ceilings were removed, and the maximum Federal share of the project cost was raised from 30 to 40 percent if the State contributed 30 percent, and to 50 percent if the State contributed 25 percent and if enforceable water quality standards were established for the project receiving waters. Reimbursement of State or local funds (up to the full Federal share) from future Federal fund allotments was authorized if adequate Federal funds were not currently available. Proportionately more funds were authorized for larger communities and more populous States. Grants to develop basin water pollution abatement plans were authorized; State program grant assistance was increased; and research and demonstration grants were authorized in the areas of advanced waste treatment and water purification, joint municipal-industrial treatment, and pollution by industry. Also, a study of pollution in the Nation's estuaries and special studies on costs, manpower, watercraft pollution, and incentives to industry for pollution control were directed. Authority was provided in an enforcement conference to request an alleged polluter to file a report on the character and quantity of his discharges and on the measures being taken to prevent or reduce them. Authority was provided to require such information in a hearing.

1970 AMENDMENTS

The 1970 law repealed the Oil Pollution Act of 1924 (originally an Army Corps of Engineers authority vested in 1966 in the Secretary of the Interior) and added strong oil pollution control provisions to the basic Federal Water Pollution Control Act. EPA enforcement responsibilities in the implementation of this authority are described in Chapter V, *Federal Enforcement.* The removal of hazardous substances other than oil was provided, but, pending a study and report to Congress, no liability or penalty provisions as in the case of oil. Sewage from watercraft, mine drainage, lake eutrophication, Great Lakes pollution, manpower requirements, and pesticides were aspects of the total pollution problem addressed in the 1970 law. An important provision added to the basic act was that before a Federal licensing or permitting agency could issue a Federal license or permit, it had to be provided with State (or in some cases Federal) certification that applicable water quality standards would not be violated. Regulations governing marine sanitation devices promulgated under the watercraft pollution authority would preempt State and local regulation, but a State could seek a prohibition of any sewage discharge from a vessel. The oil pollution control provisions expressly preserved the right of States



The 1965 Amendments provided for the establishment, revision and enforcement of water quality standards designed to provide water of proper quality for a range of designated uses. (Truckee River, Nevada. EPA-DOCUMERICA—BELINDA RAIN)

and localities to impose any requirement or liability.

1972 AMENDMENTS

The most extensive and far-reaching amendments to the Federal Water Pollution Control Act were those enacted in 1972. They reflect a concern for the Nation's waters and a strong commitment to end water pollution. They set the stage for a coordinated series of specific actions that must be taken—with strict deadlines and strong enforcement provisions—by Federal, State and local governments and by industries.

Some of the more important requirements organized by activity or area of concern are:

Industrial Pollution

- Industries must use "best practicable" water pollution control technology by mid-1977 and the "best available" by mid-1983.
- Discharges of toxic pollutants will be controlled by effluent standards to be issued by 1974.
- Industries must pre-treat effluents that are discharged into municipal treatment systems.

Municipal Pollution

- Federal construction grants up to $18 billion are authorized over the next three years to help local governments build needed sewage treatment facilities.
- An additional $2.75 billion is authorized to reimburse local governments for treatment plants constructed earlier in anticipation of Federal grants.

The most extensive and far-reaching amendments to the Federal Water Pollution Control Act were those enacted in 1972. (EPA-DOCUMERICA—CHARLES O'REAR)

- The Federal share of treatment facilities costs is increased to 75 percent (the maximum Federal share was 55 percent under previous legislation). An Environmental Financing Authority is established to help State and local governments raise their share of the cost of treatment facilities.
- Secondary treatment will be required for plants approved for construction before mid-1974; "best practicable" treatment will be required for plants approved thereafter.
- Treatment plants must provide a minimum of secondary treatment by mid-1977 and for plants under construction by mid-1978.
- All plants must apply any higher treatment necessary to meet water quality standards by mid-1977.
- All treatment plants will have to use "best practicable" treatment by mid-1983.
- Areawide waste treatment management plans shall be established by mid-1976 in areas with substantial water pollution problems.

Nonpoint Source Pollution

- EPA is required to develop information on (1) the nature and extent of nonpoint sources of pollution and (2) means to control such pollution from a range of activities.
- States are required to (1) submit reports on nonpoint sources of pollution, and (2) recommend control programs.

Water Quality Standards

- States must adopt water quality standards for intrastate waters and submit them by April 1973 for EPA approval. EPA is required to set standards if the States fail to do so.
- EPA is required to submit a report to Congress by 1974 on the quality of the Nation's waters.
- The States are required to submit to EPA and the Congress similar reports on waters within their borders by 1975.

- A national surveillance system to monitor water quality will be established by EPA in cooperation with other Federal agencies and State and local governments.

Permits and Licenses

- The 1899 Refuse Act permit program is replaced by a new permit system which requires that no discharge of any pollutants from any point source.
- Publicly-owned treatment works, certain other municipally controlled discharge points, and commercial, agricultural and industrial dischargers must obtain permits.

Enforcement

- The 1972 law supplanted the former enforcement mechanisms with authority to enforce permit conditions and other requirements of the law through court action or administrative orders. Civil and criminal penalties can be applied to dischargers who violate permits.
- EPA is provided emergency power to seek immediate court injunctions to stop pollution. That represents an imminent or substantial danger to health or welfare.
- Dischargers may be required to keep proper records, install and use monitoring equipment, and sample their discharges.
- EPA is provided authority to enter and inspect any polluting facility
- Any citizen or group of citizens whose interests may be adversely affected has the right to take court action against anyone alleged to be violating an effluent standard or limitation, or an order with respect thereto issued by EPA or a State; or against the Administrator for his alleged failure to perform a nondiscretionary act or duty.

Some of the specific requirements of the Act and progress made toward their implementation are discussed in the following chapters of this report.

II. Water Quality Planning and Surveillance

The 1972 amendments to the Federal Water Pollution Control Act obligated the Environmental Protection Agency to undertake a comprehensive reassessment of its programs, policies, and general control strategies. Major attention has been given to the greatly expanded planning requirements stipulated by the legislation. Major attention has also been afforded the development of a more extensive and usable water quality surveillance system.

THE PLANNING APPROACH

The 1972 amendments provide a combination of two basic methods to achieve national water quality goals: effluent limitations based on control technology, and effluent limitations based on water quality standards.

Through its water quality planning activities, EPA will implement a control strategy designed to delineate the alternative solutions for those areas in which pollution is most severe and in which significant population concentrations would benefit from clean water.

The varying severity and nature of the water pollution problem throughout the country has resulted in a control strategy that embraces the following precepts:

- Water pollution control must be directed toward those areas where the problem is most severe. Generally, these areas are coincident with areas of greatest population concentration; a cleanup will thus have an impact on large numbers of people.
- EPA develops the guidelines by which river reaches are assigned priority for cleanup, but actual delineation of the areas is a State responsibility. This process will increase both State participation in and responsibility for implementation of the Act.
- EPA will initially concentrate on the 1977 water quality goals established by the legislation (secondary treatment of municipal discharges, best practicable control technology for industrial dischargers, and more stringent limitations where they are needed to meet water quality and treatment standards). But the 1977 goals will not be implemented so as to preclude meeting the more restrictive 1983 goals.
- Paramount in the planning process will be the establishment of a continuing process by which States set priorities for the complex control actions required by the law.
- EPA will emphasize the preservation of existing high quality waters and, at the same time, the improvement of substandard ambient conditions to meet water quality standards.

Water Quality Planning functions are delineated in the new legislation under sections 303(e), 208, and 201; of these, 303(e) provides the overall framework for management of State efforts.

STATEWIDE WATER QUALITY PLANNING [SECTION 303(e)]

The statewide water quality planning required by Section 303(e) is designed to be the central management tool of the States in administering their water quality programs. The planning process will provide direction to resource expenditures through establishing priorities and schedules of action. It will also provide the goals and framework for construction grant planning and areawide planning required by sections 201 and 208. A prime objective of the process is to

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Water pollution control priority will be afforded those areas where pollution is most severe.

Preservation of existing high quality waters will receive major attention. (Image Lake with Glacier Peak in background. State of Washington)

achieve maximum effectiveness in pollution control programs.

The planning requirements of several other sections of the Act will be achieved through the 303(e) planning process, including those concerning water quality inventories, protection and restoration of lakes, water quality surveillance, and costs of water quality programs.

Emphasis will be afforded basin planning which will (1) identify water quality problems and their relative severity, (2) direct the application and mix of program elements such as local planning, monitoring, permitting, and construction grants toward solution of these problems, (3) set the effluent limits for each discharge in the basins, and (4) provide the basis on which the States' water quality program plans under section 106 will be developed.

Basin plans will be either section 303(e) management plans covering basins where there are relatively few water quality limited segments,[1] or more complex full plans for the smaller number of basins with many water quality limited segments where load allocations must be prepared for dischargers to meet water quality standards. Both kinds will be prepared by the States.

The general approach to be employed in preparing section 303(e) plans will entail the following steps:

- States will be required to classify all river segments as either water-quality limited or effluent-guidelines limited. An effluent-guidelines limited segment would meet water quality standards after application of the best practicable control technology for industry, and secondary treatment for municipal plants. All other segments would be classified as water-quality limited. States should submit the classification list as part of their initial response to section 303(e) regulations.
- For water-quality limited segments for which adequate data is available to make load allocations, full plans should be prepared and submitted no later than June 30, 1973.
- For water-quality limited segments for which adequate data is not available to make load allocation, States should identify resources and time schedules for obtaining the necessary data and completing the required full plans.
- For effluent-guidelines limited segments, States should begin preparing 303(e) management plans.

The section 303(e) planning process provides that the level of planning for a basin is to be tailored to the complexity of the pollution problems in the area and to the information requirements for water quality decisions in that basin.

All plans are required to include:

- a display of in-stream water quality data to certify that segments are properly classified as water quality class or effluent limitation class,
- an assessment of needs for publicly owned treatment works,
- an inventory and ranking of individual dischargers, and
- schedules of compliance and effluent requirements for dischargers.

In addition, plans for water quality class will include:

- an assessment of total maximum daily loads necessary to meet water quality standards,
- an assessment of whether effluent limitations established will achieve the needed reductions to achieve water quality standards, and
- an assessment of nonpoint-source pollution and needed control measures.

AREAWIDE WASTE TREATMENT MANAGEMENT PLANNING (SECTION 208)

Areawide waste treatment management (AWTM) planning will be accomplished primarily in metropolitan areas that have substantial water quality problems requiring treatment levels beyond secondary for municipal wastes and best practicable control technology for industrial

[1] Water quality limited segments are those portions of a basin where it is known that water quality does not meet applicable water quality standards, or which are not expected to meet such standards even after application of best practicable control technology for industries, or secondary treatment for municipalities.

wastes. The planning would be limited to areas where units of local government have agreed, or have indicated their intent, to operate a coordinated waste treatment management system. Generally, the Governors of the States involved will designate the AWTM areas and the planning agencies that will conduct the work. The planning will include description of the regulatory programs required to assure pretreatment of industrial and commercial wastes and to abate nonpoint source pollution.

Draft regulations covering designation of AWTM planning areas are being prepared and are scheduled for publication by May 1973. Preparation of guidelines covering AWTM planning procedures has been initiated with completion scheduled for June 1973.

PLANNING FOR CONSTRUCTION OF TREATMENT WORKS (SECTION 201)

Approval of construction grants will be contingent, in part, on evidence that alternatives and least-cost solutions have been investigated, and that the projects will be consistent with plans to meet water quality standards and effluent limitations. The facilities planning involved will emphasize the cost-effective evaluation and the environmental assessment of alternatives. The alternative approaches to be considered are grouped into three broad categories: (1) treatment and discharge to receiving water, (2) treatment and reuse, and (3) spray-irrigation or other land disposal. The most cost-effective solution to correct excessive infiltration of the sewer collection system will also be examined. Through the facilities planning process, unnecessary expenditure of public funds is expected to be avoided.

Regulations covering grants for construction of treatment works are under preparation and are scheduled for publication by summer 1973. Supplemental guidelines covering facilities planning are scheduled to be published by July 1973.

The Federal role, in addition to preparing regulations and guidelines, will involve (1) the development of criteria for the construction grant priority list, (2) providing funds at the applicable rate for approved projects and (3) participating in the various stages of construction. Such participation will emphasize preapplication and design conferences, and the assessment of environmental impacts.

WATER QUALITY SURVEILLANCE

Effective planning requires an adequate water quality data base. Under the strategy developed by EPA, the States will undertake intensive monitoring surveys as an integral part of their continuing planning processes. These surveys will provide the States with an understanding of their water quality problems, including data to describe cause and effect relations of pollution in each river basin. For section 303(e) plans these surveys will provide the basis for determining the effects of point and non-point sources of pollution on receiving water quality.

At the national level, the 1972 amendments provide for the establishment of a national water quality surveillance system. This network of stations will provide a baseline of data against which the effects of pollution control actions can be assessed.

One of the most frequent problems encountered in developing such a baseline is the difficulty of measuring localized concentrations of pollutants. The location and characteristics of these concentrations make monitoring more difficult and the interpretation of data more complex. With this problem in mind, EPA is developing a plan to establish permanent monitoring sites primarily located at points upstream and downstream of major concentrations of polluters. These sites will be part of the National Water Quality Surveillance System required by Section 104(a)(5), and will be operated in cooperation with the States and other Federal agencies.

Until the surveillance system is operative, data for national assessments will come from existing sites operated by States, EPA and other Federal agencies. Using data from such sites, EPA is preparing a report that will cover both local and widespread pollution concentrations in selected major rivers of the Nation.[1] The report is scheduled for completion in January 1974.

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[1] Selected for analysis are the following basins: Missouri, Mississippi, Rio Grande, Yukon, Arkansas, Colorado, Columbia-Snake, Ohio-Allegheny, Red (Oklahoma-Arkansas), Brazos, Tennessee, Mobile-Alabama, Susquehanna, Willamette, Hudson-New York Harbor, Los Angeles Harbor, Chicago-Lake Michigan, Delaware, Detroit, San Francisco Bay-Sacramento River, Potomac, Boston Harbor. Data and other constraints may preclude inclusion of all of these basins in the forthcoming report.

PLANNING PROBLEMS AND STATUS

Problems. Problems relating to implementation of the water quality planning requirements of the new legislation fall generally under the following categories:

- Structuring national programs to accommodate widely varying types and extent of pollution.
- Coordination with States and local entities.
- Coordination among affected EPA programs and with other interested Federal agencies.

Resolving implementation problems will require a continuing effort, since many of the problems are not susceptible to a single, easy solution. Therefore, continuing review, refinement, and reassessment will be vital to efficient program development. Provision has been made for such activities in both the regulations and the guidelines prepared by this agency.

Coordination is of prime concern since so many different types and levels of government are affected. Steps are being taken at both the headquarters and regional levels to assure coordination.

Status. Tables 1 and 2 display information on river basins. The basin categories will determine the type of planning that will be employed to help meet water quality objectives.

TABLE 1

DISTRIBUTION OF POPULATION AND MAJOR INDUSTRIAL DISCHARGERS BY TYPE OF BASIN*

Type of basins	Number of basins	Population accounted for (%)	Number of major industrial dischargers	Average number of major industrial dischargers per basin
Critical†	89	65	1,590‡	18
Other	178	35	1,078**	7

*Does not include 24 nonpriority basins in Alaska, Hawaii and U.S. Territories.
†Basins where pollution is most severe and significant concentration of population would benefit from cleaner water.
‡Equals 60 percent of total major dischargers.
**Equals 40 percent of total major dischargers.

TABLE 2

SYNOPSIS OF BASINS

Type of basin	Low in nonpoint-source pollution	High in nonpoint-source pollution	Total basins
Critical basins	79	10	89
Other basins:			
High pollution	—	18	18
Medium pollution	30	10	40
Low pollution	68	28	96
Uncategorized*	—	—	24
Total	177	66	267

*Basins located in Alaska, Hawaii, and U.S. Territories.

III. Water Quality Research

The search for new and improved solutions to old problems through research, development, and demonstration is an important element of EPA's overall water quality control program. In broad terms, these activities may be divided into three categories—processes and effects, control technology, and implementation analysis.

PROCESSES AND EFFECTS

Ecological Effects. Studies of ecological effects are directed primarily toward the development of criteria to be used in the setting of water quality standards. Such standards will cover fresh water, estuarine, and marine uses. Research results will also be used to develop predictive capabilities for short term and long term effects of pollutants on species, community structure, and total ecosystems. Current research is specifically directed toward (1) determining acceptable levels of pesticides and pesticide derivatives in freshwater, estuarine, and coastal waters, (2) determining the effects of organic chemicals, heavy metals, petroleum, and petroleum by-products on freshwater and marine life, and (3) determining the temperature and dissolved oxygen requirements for freshwater and marine life.

EPA has published a number of reports pertaining to ecological effects, including the *Water Quality Data Book:* Vol. I, *Organic Chemical Pollutants of Freshwater;* Vol. II, *Inorganic Chemical Pollutants of Freshwater;* Vol. III, *Effects of Chemicals on Aquatic Life;* and Vol. IV, *An Investigation into Recreational Water Quality.* Guidelines for pesticides will be published in early 1973, primarily for use by the States.

Research has shown that polychlorinated biphenyls (PCB's) have the highest cumulative effect in freshwater fish and invertebrate tissue of any organic chemical known. Because of this, the safe concentration of PCB has been revised downward by one to two orders of magnitude in the latest revision of water quality criteria.

Studies have also determined that chlorine used to disinfect waste treatment plant effluents has great potential harm on aquatic life. As a result of this finding, an effort is underway to demonstrate alternative disinfection methods and dechlorination methods.

A research facility has been established that is capable of testing the sensitivity of adult salmon to water pollutants. Results thus far have shown that adult salmon are more sensitive to a large number of pollutants than are the young.

Health Effects. Major attention must be afforded health effects in the development of water quality standards. Accordingly, EPA has assigned priority attention to research activities in this problem area. Current research stresses the health effects of chemical and infectious contaminants in drinking and recreational water. During 1973 and 1974 emphasis will be placed on an assessment of the toxic effects of trace minerals in the environment.

Transport Processes. Research on transport processes involves the study of the routes, rates, and mechanisms of pollutant movement and transformation in surface and underground bodies of water. Knowledge of these factors aids in predicting the environmental consequences of discharging pollutants to bodies of water. Pollutants receiving research emphasis are persistent organics, heavy metals, and nutrients.

Research attention has also been directed toward the effects and methods of controlling thermal discharges. A thermal discharge report, required by the new water quality legislation, is scheduled for release by July 1973. Eight monographic reviews covering various aspects of the thermal problem will be made. In addition, EPA has requested selected Federal agencies[1] to contribute to the report.

[1] Tennessee Valley Authority, National Science Foundation, Federal Power Commission, National Oceanographic and Atmospheric Administration, and Bureau of Sport Fisheries and Wildlife.

A broad range of research activities have been undertaken to develop water quality measurement techniques and instrumentation. (A helicopter adapted to land in lakes for water samples and measurements.)

Much of the research in the water supply area is directed toward improving the quality of drinking water. (School children testing water in Ft. Smith Arkansas.) (EPA-DOCUMERICA—JIM OLIVE)

Measurements and Instrumentation. A broad range of research activities has been undertaken to develop water quality measurement techniques and instruments. The more significant research efforts are discussed briefly below:

- Development of test procedures required in the promulgation of effluent guidelines under section 304(g) is underway. Thirty-eight methods have been completed and are ready for publication by reference in the *Federal Register*. Twenty-eight additional methods will be completed by March 15, 1973.
- A system for characterizing the organic components of municipal and industrial wastes has been developed. Work is in progress to establish "fingerprints" for each constituent in the wastes.
- A chemical indicator of fecal pollution to rapidly detect contamination of potable water has been developed. This method is superior to earlier microbiological techniques, as it is independent of nutrient concentration in the water and is not subject to falsification by other sources of microorganisms.
- A device has been developed for extracting and concentrating viruses from water at very low concentrations. The concentrate can be shipped from the field to central laboratories for subsequent analysis. The lack of this capability has been the major deterrent to large scale surveys of water sources for viral contamination.
- An instrument capable of detecting the highly toxic organophosphorous pesticides at a level of one part per billion has been developed.
- A fluorescent antibody technique, which is rapid and specific, has been developed for the detection of streptococci bacteria.

Water Supply. Much of the research in the water supply area is directed toward improving the quality of drinking water as opposed to the prevention or control of water pollution. Current work includes studies on diseases associated with water-based recreation. For example, several projects are underway to quantify the measurement of bacterial pathogens and indicators in bathing waters. Useful results were obtained on salmonella-coliform ratios to support current criteria for body-contact-recreation water standards.

A test method has been developed that allows a reduction from 4 days to 7 hours in the time required to complete a coliform test. This will provide for one-shift control at water treatment plants or bathing beaches.

CONTROL TECHNOLOGY

Research, development, and demonstration programs are necessary to establish a technological base for the implementation of water quality objectives. Initially, emphasis will be placed on municipal, industrial, and other point sources of water pollution. Later, as the point sources of pollution are brought under broadened control programs, emphasis will shift to research of nonpoint sources.

Municipal. Conventional wastewater treatment, still in use in most localities, was developed over a period of years to remove suspended solids, biodegradable organics, and to some degree, microorganisms. The efficiencies of these treatment processes are generally below today's requirements. In addition, the characteristics of the wastewater to be treated have changed considerably because of the increasing amounts of industrial waste in municipal sewage. Therefore, new and improved treatment processes and process combinations are required.

Improved treatment processes in practice today, which are to a large extent the result of EPA's research, development, and demonstration efforts, include processes that reduce the suspended solids, microorganism, and biodegradable organics content of municipal wastewater to very low levels. Processes are also available to reduce nutrient materials such as phosphorus and nitrogen, refractory organics, some heavy metals, and viruses to low levels. Improvement in operational reliability and process control through the use of better electronic sensing devices and computers is being made.

Collection and transport system technology has also been upgraded. Means of exercising control of flow in collection systems have been developed and demonstrated. Thus, it is possible to store or route flows to prevent system overflows and to equalize flow to treatment works. High-rate methods for treating overflows from combined sewers have been developed. Separation of sewers is no longer considered necessary or desirable in all cases for

the control of pollution from combined sewer overflows, as equivalent control can be achieved at lesser cost.

Future work in the municipal technology area will include refinement of several of the newer unit processes to achieve better cost effectiveness and to improve process reliability. Additional emphasis will be placed on cost effectiveness factors of treatment processes. New efforts will be initiated toward developing the ability to reduce sewage flow. These efforts will include work in the area of infiltration control.

Systems developing joint liquid and solid waste transport and treatment will be investigated. The current minimal efforts in developing improved technology for collection and treatment of rural sewage will be upgraded. Sludge treatment and its ultimate disposal is an area of great concern, and additional work will be conducted in sludge processing and alternative treatment techniques.

A total collection-transport-treatment concept will be emphasized in EPA's approach to research, development, and demonstration programs.

Industrial. The industrial pollution control program, which emphasizes innovative, efficient, and economical technology, is focused on (1) recycling and resource recovery, (2) integrating facilities to jointly meet other environmental problems such as solid waste and waste heat, and (3) facilities that produce alternative resources such as power or heat. The technology is structured toward recovery of some or all of the costs of control through sale of control byproducts and resources. The research efforts, in addition to demonstrating technological capabilities, will also contain an assessment of the direct costs of the facilities and benefits such as cost savings arising from byproduct recovery, more efficient production processes, and water recycling.

Joint industrial-municipal projects are planned that will demonstrate comprehensive and alternative approaches to regional waste management and/or treatment. They will be developed during the period 1973-76 with States and other public institutional water management authorities.

Requirements for industrial wastewater will be established by the formulation of industrial guidelines. Research for the guidelines will cover the character of the industries, their wastes, and the best practical and best available pollution control technologies currently employed. Research will also establish the pretreatment requirements for industrial discharges to public systems and identify the limits of toxic industrial pollutants for discharge to public treatment systems and receiving bodies of water.

EPA will expand treatment and control research of new methods and processes for the abatement of thermal pollution.

Nonpoint Sources. Nonpoint sources of water pollution is another problem area in which major research, development, and demonstration efforts will be applied. The efforts will be directed primarily toward obtaining information on the nature and means of controlling pollution from agricultural, mining, construction, and forestry activities, and to control and abate pollution from oil and hazardous materials spills.

IMPLEMENTATION RESEARCH

Implementation research, based primarily on economic and systems analyses, assists EPA in meeting its environmental protection responsibilities. The research includes: (1) development of improved techniques for quantification of economic benefits and damages related to various levels of water pollution, (2) development of improved methods for setting and implementing both ambient and emission water quality standards, (3) development of procedures to assist EPA in responding to the National Environmental Policy Act, (4) exploration of fiscal and other alternatives to the regulatory process for achievement of environmental goals, and (5) a search for optimal water quality management concepts.

Completed economic analysis projects include assessment of the benefits of improving the quality of a recreational lake, a compilation of available current water pollution cost and benefit functions, a study of the effect of water pollution on land values, and a bibliography of water pollution costs literature containing nearly 2,000 entries.

Concerning environmental standards, the following projects were completed: (1) analysis of the feasibility of a strict interpretation of "zero-discharge" standards for water pollution, (2) exploration of the desirability of applying environmental quality standards on a combined air-water-solid waste basis, (3) an assessment of

the use of reliability criteria in setting water quality standards, and (4) development of quantitative procedures for designing water quality standards surveillance systems.

Systems evaluation projects completed include an assessment of land use controls for protecting water quality, demonstration of water quality enforcement information systems, development of procedures for comprehensive management of phosphate pollution on an area-wide basis, investigation of the air and solid waste pollution problems associated with water pollution control, a demonstration of regional water quality planning in a rural area, and development of procedures for analyzing cost effectiveness of water quality monitoring systems.

In response to the 1972 amendments, a project was initiated to determine and document the most effective benefit analysis techniques and practicable costs currently available for environmental analysis.

A study was begun to analyze the impact of the availability of water and sewer services on land development in the Lake Tahoe Basin. A related project, conducted in cooperation with the Council on Environmental Quality, considers the sewers-development question in a more general sense. Further study on this topic will investigate the use of environmental impact analyses of water supply and wastewater facilities in regional development decisions.

Projects were started on regional analysis of ambient and effluent standards, design of optimal effluent monitoring systems, and air-water-solid waste impacts of strict ocean disposal standards. Also, projects have been initiated (1) comparing the cost effectiveness of stormwater pollution control versus sewage treatment in a metropolitan area, (2) exploring new financing methods for pollution control equipment, (3) identifying the economic factors related to the potential reuse of used lubricating oils, and (4) investigating the use of crop insurance to decrease the demand for pesticides.

Research results are made available to all interested parties, particularly government authorities charged with water quality control at the Federal, interstate, State, regional, and local level.

IV. Development of Industrial Effluent Limitations

Industries discharge into our Nation's waters a broad range of pollutants. In the aggregate, they form the largest and most toxic of all concentrated sources of pollution. On the average, industry discharges about three times the amount of waste that is discharged by all the sewered private residences in the United States, and the volume is increasing several times as fast as that of sanitary sewage.

The 1972 amendments provide for a vigorous attack on industrial water pollution, with set deadlines for a number of specific control actions. Guiding the control program will be two salient requirements: (1) existing industries discharging pollutants into the Nation's waters must use the best practicable water pollution control technology currently available by July 1, 1977; and (2) they must employ the best available technology by July 1, 1983.

EPA will publish effluent limitations and guidelines to define the "best practicable" and "best available" technologies for various industries, by October, 1973. The guidelines can be adjusted for several factors, including the cost of pollution control, the age of the industrial facility, the process used, and the environmental impact (other than water quality) of the controls. EPA will also identify where possible pollution control measures for completely eliminating industrial discharges.

After May 1974 new sources of industrial pollution must use the best available demonstrated control technology which will be defined by EPA in the form of standards of performance for various industries. Where practicable, EPA may require that there be no discharge of pollutants from new industrial facilities.

Review of the legislation reveals that most of the required industrial pollution control activities are closely interrelated. Because of the close relationship, these activities are being performed simultaneously for each industry that is to be studied.

Contracts are being negotiated with responsible contractors to perform the necessary studies and analyses of the 27 industrial categories listed in section 306 of the FWPC Act. A tabulation of the industrial categories together with an estimation of the number of dischargers involved is shown in Table 1. The legislation directs that additional categories be identified and added to the mandatory listing already provided by Congress. Eighteen additional categories have already been identified as having substantial impact on critical river basins (Table 2), and 16 more categories (Table 3) have been identified for remaining industries. Both lists will be expanded as work progresses in identifying permit applicants and as pretreatment and cost recovery requirements are implemented.

GUIDELINE DEVELOPMENT

In the development of effluent limitations and guidelines it is the intention of EPA to obtain technical input and obtain critical review comments from other Federal agencies, the States, industry, citizen groups, and the Effluent Standards and Water Quality Information Advisory Committee. Public hearings will be held as indicated. The steps required to develop effluent limitations and guidelines for existing sources of industrial pollution, and performance standards for new sources of such pollution are outlined as follows:

- *Industrial categorization.* A preliminary listing of industries by categories has been developed. Industries are to be subcategorized based on raw material used, product produced, manufacturing processes employed, and other factors.
- *Waste characterization.* Raw waste characteristics for each category and/or subcategory must be identified. A waste and wastewater material balance is performed,

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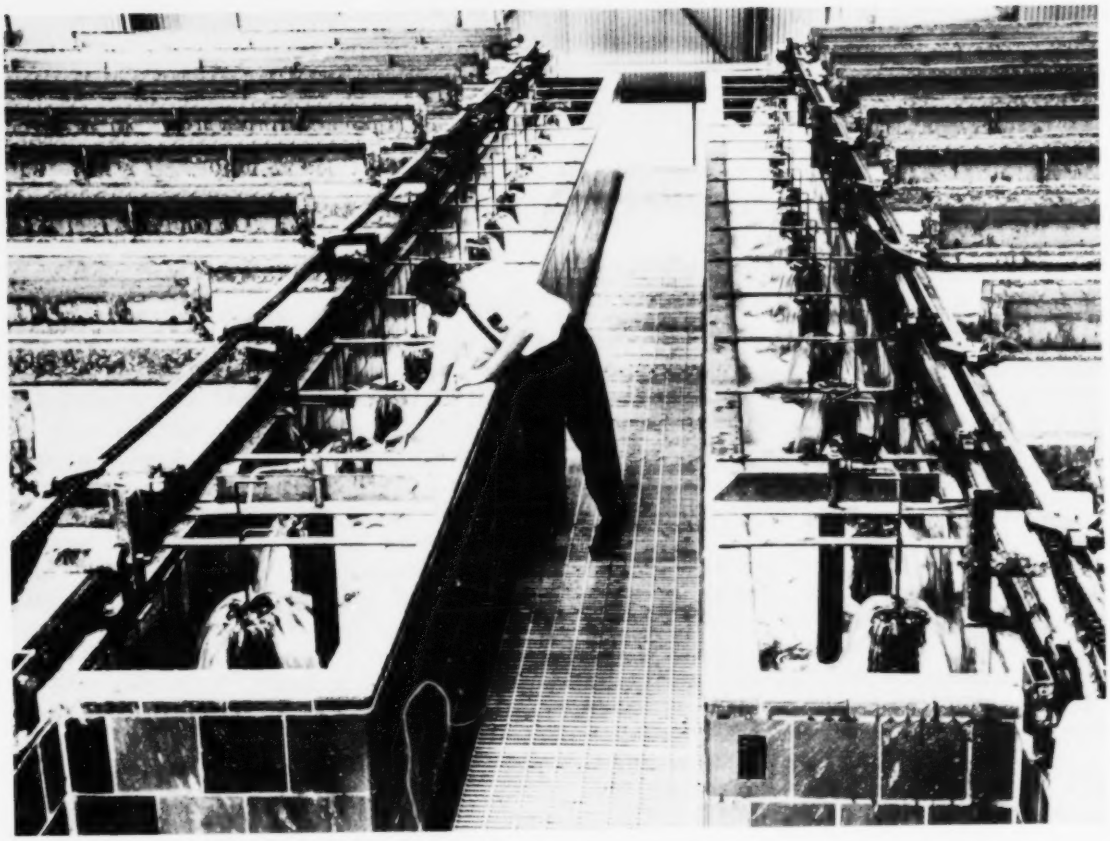

Industries discharging pollutants into the Nation's waters must employ the best practicable water pollution control technology by mid-1977 and best available technology by mid-1983. (A paper mill waste treatment plant.)

indicating the source, flow, and volume of water and wastewaters. Constituents (including thermal) and the chemical, physical, and biological characteristics of all wastewaters (including toxic and other constituents causing taste, odor, and color effects) are identified.

- *Identification, documentation and verification of control and treatment technology.*

  This step includes consideration of the following items:

  - In-plant control techniques
  - All existing and potential treatment and control technologies (including in-plant and end-of-process technologies)
  - Limitations and reliability of each treatment technology and required implementation time
  - Effects of application of each treatment technology on other pollution problems
  - Resulting solid wastes and solid waste control technologies
  - Intake structure technology

- *Development of cost information.* For each treatment technology cost information must be developed for investment costs and annual costs (including capital costs, depreciation, operating and maintenance costs, and energy and power costs).

- *Evaluation of data.* Data will be evaluated to determine the best practicable control technology currently available (Level I), the best available technology economically achievable (Level II), and the best available demonstrated control technology (Level III).

The effluent limitations and guidelines for existing sources and performance standards for new sources of pollution are being developed for the 27 industrial categories (listed in Table 1) in accordance with the steps outlined above. These categories will be formally identified by publication in the *Federal Register* by February 1973.

TABLE 1

MAJOR INDUSTRIAL CATEGORIES LISTED IN FWPC ACT

	Category	Permit applications	Major dischargers
1.	Pulp and paper mills	404	306
2.	Paperboard, builders paper and board mills		
3.	Meat product and rendering processing	307	19
4.	Dairy product processing	301	10
5.	Grain mills	71	16
6.	Canned and preserved fruits and vegetables processing	308	46
7.	Canned and preserved seafood processing	456	98
8.	Sugar processing	137	143
9.	Textile mills	550	14
10.	Cement manufacturing	100	0
11.	Feedlots	24	0
12.	Electroplating	472	125
13.	Organic chemicals manufacturing	276	112
14.	Inorganic chemicals manufacturing	214	102
15.	Plastic and synthetic materials manufacturing	174	35
16.	Soap and detergent manufacturing	54	14
17.	Fertilizer and phosphate manufacturing	480	52
18.	Petroleum refining	193	130
19.	Iron and steel manufacturing	328	111
20.	Nonferrous metals manufacturing	278	32
21.	Steam electric powerplants	2,619	357
22.	Ferroalloy manufacturing	48	13
23.	Leather tanning and finishing	338	31
24.	Glass manufacturing	132	17
25.	Asbestos manufacturing	43	12
26.	Rubber processing	306	27
27.	Timber products processing	402	32
	Total	9,015	1,854

TABLE 2

ADDITIONAL INDUSTRIAL CATEGORIES WITH IMPACT IN CRITICAL RIVER BASINS

Ranking*	Category	Permit applications	Major dischargers	Major dischargers in critical river basins
1	Coal mining	798	31	23
2	Water supply	898	28	16
3	Motor vehicles	317	19	12
4	Nonferrous metal forming	210	30	12
5	Nonelectrical machinery	276	16	11
6	Misc. food and beverage	422	60	24
7	Petroleum and gas	1,031	28	9
8	Fish hatcheries and fish farming	309	19	---
9	Electrical machinery	333	26	10
10	Limestone	392	10	4
11	Misc. mineral products	152	11	4
12	Metal mining	403	54	6
13	Misc. chemicals	320	71	10
14	Fabricated metal products	337	11	4
15	Sand and gravel	397	22	2
16	Railroads	326	8	1
17	Paving and roofing materials	129	8	5
18	Steam supply	17	1	1
	Total	6,662	453	174

*This ranking is based upon impacts within critical basins.

TABLE 3

REMAINING INDUSTRIAL CATEGORIES IDENTIFIED AS SIGNIFICANT

	Category	Permit applications	Major dischargers	Major dischargers in critical river basins
1.	Misc. plastic products	164	4	0
2.	Auto and other laundries	185	0	0
3.	Natural gas liquids	157	1	0
4.	Converted paper products	124	27	0
5.	Chemical and fertilizer mining	57	13	0
6.	Petroleum products, wholesale	449	1	0
7.	Public warehousing	152	0	0
8.	Airports	60	5	0
9.	Groceries	65	0	0
10.	Printing	64	1	0
11.	R&D laboratories	53	0	0
12.	Marine cargo handling	46	0	0
13.	Sanitary services	42	9	0
14.	Gasoline service stations	29	0	0
15.	Hospitals	28	0	0
16.	Miscellaneous*	1,470		
	Total	3,145	61	0

*Includes a number of permit applications that are not classified at this time.

V. Federal Enforcement

FEDERAL ENFORCEMENT PROCEDURES BEFORE THE 1972 AMENDMENTS (OCTOBER 18, 1972)

Before the 1972 amendments, the FWPC Act provided for (1) the abatement of pollution of interstate or navigable waters endangering the health or welfare of persons, and (2) the abatement of pollution lowering the quality of interstate waters below the water quality standards established under the Act.

The first authority, provided in 1956 and expanded by subsequent enactments, set out a three-step enforcement procedure—conference, public hearing, and court action. The succeeding step was taken if satisfactory progress toward abatement was not attained at the preceding step. A conference could be called either at State request, in a case of interstate or intrastate pollution, or initiated by EPA, in a case of interstate pollution. The EPA Administrator could initiate a conference in certain cases of pollution resulting in economic injury to shellfish producers, whether or not the pollution of interstate or navigable waters was interstate in effect. The conferees (representing EPA, the States, and any interstate water quality agency) convened to review the existing situation and any progress made, to lay a basis for future action for all parties concerned, and to give the States, localities, and industries an opportunity to take any indicated remedial action under State and local law.

The second authority, provided in 1965, permitted court action against a discharger alleged to be in violation of water quality standards after expiration of a 180-day notice period. The legislative history of the 1965 enactment directed that an informal hearing be held at the request of a State, the alleged violator, or other interested party so that voluntary agreement could be reached if possible during the 180-day period, thus eliminating the necessity for suit. EPA regulations provided for an informal hearing in any case of a water quality standards violation notice.

The FWPC Act was amended in 1970 to provide for the abatement of pollution by oil in navigable waters, on adjoining shorelines, and in the Contiguous Zone. EPA has shared responsibilities in such abatement with the Coast Guard and other Federal agencies. Federal enforcement may be taken in these cases:

- Failure to notify of harmful discharge (criminal penalty)
- Knowing harmful discharge (civil penalty)
- Vessel in marine disaster (removal or destruction, cost recovery)
- Imminent and substantial threat, onshore or offshore facility (court relief)
- Recovery of cleanup cost
- Violation of removal and prevention regulations (civil penalty)

EPA was made responsible for enforcement in the case of an imminent and substantial threat to the public health or welfare because of an actual or threatened discharge of oil into or upon navigable waters from an onshore or offshore facility. Further, EPA was assigned responsibility for (1) the assessment of civil penalties in cases of violations of removal regulations in inland waters and prevention regulations with respect to nontransportation related onshore and offshore facilities, and (2) for the support of the Coast Guard in its enforcement responsibilities.

The Refuse Act, section 13 of the River and Harbor Act of 1899, prohibits the discharge of refuse (except that flowing from streets and sewers and passing from them in a liquid state) into navigable waters without a permit or in violation of the conditions of a permit. The Act was administered for many years by the Army Corps of Engineers, primarily in the interest of navigation. Although court decisions had supported the Act's use in water pollution abate-

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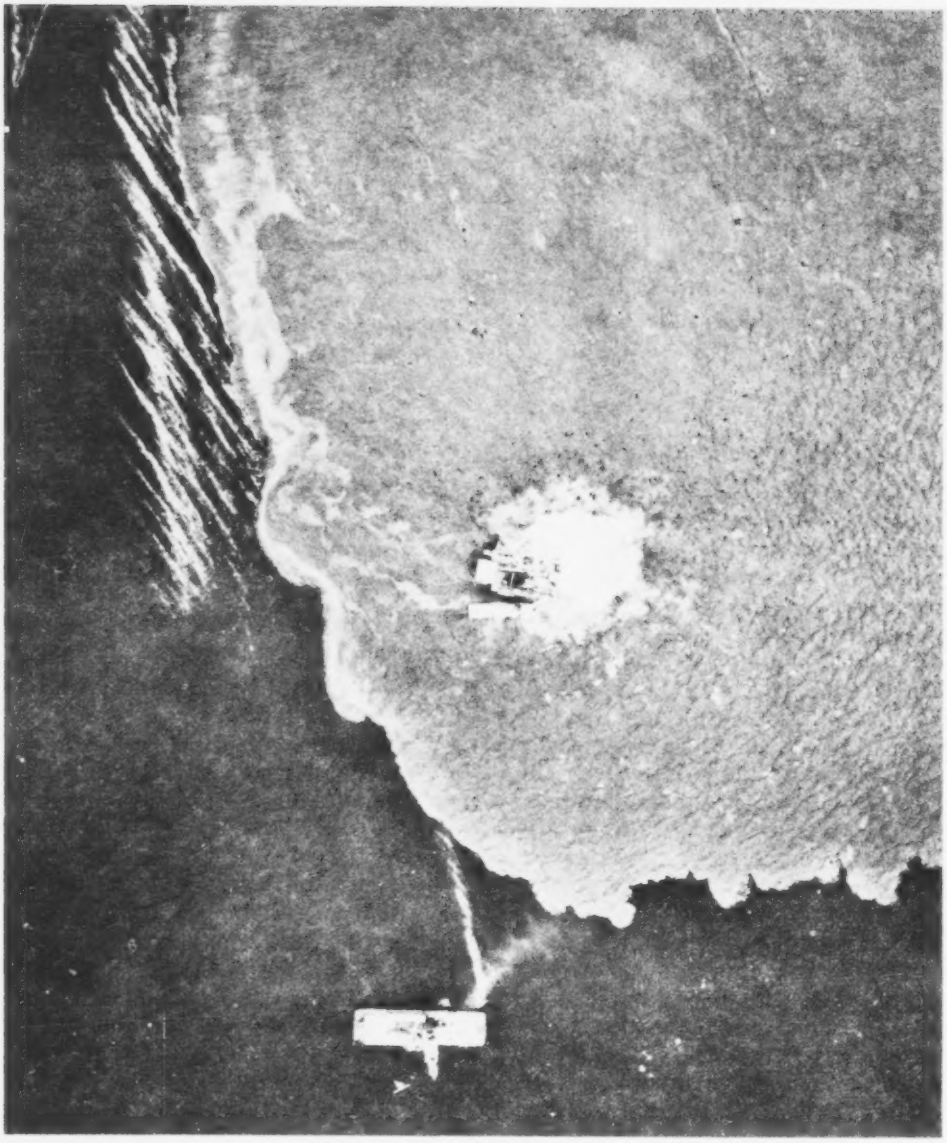

EPA shares the responsibility for abatement of pollution by oil with the Coast Guard and other agencies. (Santa Barbara Channel)

ment cases, it was not until 1970 that it became a viable water pollution enforcement mechanism. The Act does not expressly provide for injunctive relief, but the Supreme Court has ruled that the Federal Government may obtain injunctions under the Act. Generally, EPA has not recommended criminal prosecutions under the Refuse Act other than in cases of isolated or instantaneous discharges resulting in serious damage. A civil remedy has generally been more effective in preventing future pollution.

The Refuse Act Permit Program, established under Executive Order 11574, December 23, 1970, took effect July 1, 1971. The program required that all discharges or deposits into navigable waters or their tributaries, or into waste treatment systems other than municipal systems from which the matter will flow into navigable waters or their tributaries, should be made only in compliance with the conditions of a permit issued by the Army Corps of Engineers. EPA was responsible for determinations with respect to water quality aspects of the permit. The participation of the States in the program was provided for by Section 21(b) of the FWPCA, as amended in 1970, which required State certification that a proposed discharge would not violate water quality standards before a permit could be issued. If the State denied certification, no permit could be issued; EPA could, however, recommend denial of a permit even though the State had granted certification.

Under the Refuse Act, EPA regions received applications through the Corps of Engineers district offices and determined what requirements were necessary to prevent violations of water quality standards. The Corps incorporated into the permits consideration of effects on navigation and the opinions of the Department of the Interior's Bureau of Sport Fisheries and Wildlife and opinions of the Department of Commerce's National Oceanographic Atmospheric Administration. In anticipation of permit issuance, the Corps gave public notice (sometimes jointly with the State), allowed 30 days for comment, and where indicated, held a public hearing. The Corps was also responsible for such administrative decisions as whether or not to give confidential status to information supplied on the application form. The failure to make timely application for a Refuse Act permit under the program became cause for enforcement action.

To maximize the impact of the program on water quality, EPA developed a systematic approach to the job. Major dischargers (that is, the relatively small number of facilities which contribute about 85 percent of the Nation's total pollution load) were identified for early attention, as were high priority basins. A major task was the development by headquarters of guidance on achievable effluent limits for 22 different industrial categories for use by the regions as a basis for setting uniform requirements for similar facilities throughout the country. Certain conditions that would be standard to all permits were also developed. Two sophisticated computer systems were put into use to record, manipulate, and retrieve the vast amount of data that is reported on permit applications.

Of the 20,000 applications that were received, very few were complete enough to be processed. As a result, only about 25 permits had been issued by December 1971, at which time a court injunction blocked further issuance. A Federal court decision in the *Kalur* case, December 21, 1971, enjoined the granting of permits under the program until the Army Corps of Engineers amended its permit regulations to require environmental impact statements as specified by the National Environmental Policy Act. The court also held that no permits whatever could be issued for discharges into nonnavigable tributaries of navigable waters. A further legal obstacle was created by the decision of the Third Circuit Court of Appeals in the *PICCO* case, May 30, 1972, that the company could not be held criminally responsible for discharges under the Refuse Act until a permit system was in operation. These legal difficulties were removed with respect to future cases by the FWPCA Amendments of 1972. Preparation of permit requirements continued, however, in anticipation of new enabling legislation.

ENFORCEMENT PROCEDURES UNDER THE 1972 AMENDMENTS

The 1972 amendments confer major new regulatory authorities on EPA. Following is a description of the most significant procedures.

Enforcement (Section 309). Whenever the Administrator finds that any person is in violation of any condition or limitation in a State-issued National Pollutant Discharge Elimination System (NPDES) permit which implements

Sec. 301 (effluent limitations),

Sec. 302 (water quality related effluent limitations),

Sec. 306 (national standards of performance for new sources),

Sec. 307 (toxic and/or pretreatment effluent standards), or

Sec. 308 (inspection, monitoring, and/or entry requirements),

he is directed:

- To issue an order requiring compliance, which must state with reasonable specificity the nature of the violation and specify a reasonable time for compliance (not to exceed 30 days), taking into account the seriousness of the violation and any good faith efforts to comply (with copy of order to States involved, and opportunity for alleged violator to confer with Administrator in case of section 308 violation); or
- To bring a civil action for appropriate relief, including a permanent or temporary injunction, in the United States district court in which the defendant is located or resides or is doing business, which court shall have jurisdiction to restrain the violation and to require compliance (with immediate notice of the commencement of the action to appropriate State); or
- To notify the alleged violator and the State, and if the State has not commenced appropriate enforcement action after 30 days, to issue a compliance order; or
- To bring a civil action.

The Administrator is directed to give notice to a State whenever he finds that permit violations are so widespread as to appear to result from a failure of State enforcement; and if the failure extends beyond 30 days, he is directed to enforce any permit within the State through compliance order or civil action. The period of Federally assumed enforcement begins with the public notice and ends when the State satisfies the Administrator that it will enforce the permits.

The Administrator is further directed, whenever he finds that any person is in violation of sec. 301, 302, 306, 307, or 308, or of any condition or limitation in an EPA-issued or a State-issued permit implementing any of those sections, to issue a compliance order, or to bring a civil action.

Penalties. The willful or negligent violation of sections 301, 302, 306, 307, or 308, or any condition or limitation in an EPA-issued or State-issued permit implementing any of those sections is punishable by a fine of not less than $2,500 nor more than $25,000 a day, or by imprisonment for not more than 1 year, or by both, with a $50,000 fine or 2 years' imprisonment or both the maximum penalty for a second conviction.

Knowingly making a false statement in a document filed or required to be maintained under the Act, or tampering with a monitoring device, is punishable by a fine of not more than $10,000, by imprisonment for not more than 6 months, or by both.

The violation of sections 301, 302, 306, 307, or 308, of an implementing permit condition or limitation, and the violation of any compliance order issued by the Administrator, is subject to a civil penalty not to exceed $10,000 a day.

Oil and Hazardous Substance Liability (Section 311). The provisions of former Section 11 are retained largely unchanged in Section 311 of the amended Act. Hazardous substances, to be designated in EPA regulations, are made subject to the same provisions. Substances determined to be not removable are liable for money penalties.

National Pollutant Discharge Elimination System (Section 402). The provisions of this section gave the permit authority to EPA with the Corps of Engineers still responsible for evaluating effects on anchorage and navigation. The new permit program includes additional discharges in its jurisdiction—for example, municipal treatment facilities, commercial establishments, and additional agricultural activities. General farming operations, discharges to municipal treatment facilities, and a limited number of other very specific discharges are still exempt from the program. Standardized application and discharge reporting forms have been prepared for each type of discharger, requiring reporting of the minimum data elements necessary for thorough evaluation of the discharge.

The States will play a much greater role in the NPDES. Those having adequate permit programs can apply for and receive either interim authority or final approval from EPA to issue the

permits. After extensive coordination with the States, EPA prepared guidelines describing the elements that are necessary in a State program in order to receive the permit authority. EPA maintains the power to veto permits if an affected State objects to the issuance of the permit, or if the Administrator finds that it would be outside the law's guidelines and requirements, and to retract the program approval if a State fails to maintain the conditions of approval. While NPDES permits will also prohibit violation of water quality standards, the new emphasis is on compliance with the effluent requirements. Effluent guidance for industrial categories developed in connection with the Refuse Act permit program will be applied, where appropriate, in the issuance of NPDES permits. Pretreatment standards will be set for industries discharging to municipal treatment facilities, and these facilities themselves will be regulated by a formal definition of secondary treatment. Permits will be issued for a maximum of 5 years and will be conditioned to bring the discharger to the scheduled levels of water quality required by the Act.

Emergency Powers (Section 504). The Administrator is authorized to bring suit on behalf of the United States in the appropriate district court in the event of pollution which presents an imminent and substantial endangerment to the health of persons, or to the welfare of persons if the pollution endangers their livelihood (such as inability to market shellfish). The Administrator's suit in such a case may be to immediately restrain any person causing or contributing to such pollution to stop the polluting discharge or to take other necessary action.

Appearance (Section 506). The Administrator shall request the Attorney General to appear in civil or criminal actions. EPA attorneys shall represent the United States in civil actions if the Attorney General does not notify the Administrator within a reasonable time that he (the Attorney General) will appear.

Federal Facilities (Section 313). Federal agencies must comply with Federal, State, interstate and local pollution control and abatement requirements, to the same extent that any person is subject to such requirements. Since similar provisions were included in the Clean Air Act Amendments of 1970 and the Noise Control Act of 1972, a multipollutant compliance system for Federal facilities is being analyzed for feasibility.

EPA Enforcement Actions. The following table summarizes enforcement actions taken under the authorities available to EPA immediately prior to the enactment of the Federal Water Pollution Control Act Amendments of 1972. In this first annual report, we include as of possible interest to the Congress actions initiated since EPA's establishment in December 1970, and actions taken under the Refuse Act, as well as the Federal Water Pollution Control Act, inasmuch as the former statute was extensively used in water pollution abatement during the period. Appendixes A-F list the dischargers involved in actions taken under the several authorities and give additional information on the cases.

TABLE 1

SUMMARY OF WATER ENFORCEMENT ACTIONS
PURSUED BY EPA DECEMBER 2, 1970 – SEPTEMBER 30, 1972

Enforcement Actions Under the Federal Water Pollution Control Act	245*
Water Quality Standards Violation Notices (180-Day Notices) Served — (See Appendix A)	171
Enforcement Conference-type Actions — (See Appendix B)	50
Water quality standards-setting conference	1
New enforcement conferences	8
Reconvenings, additional and progress evaluation sessions of conferences	19
Approvals of conference abatement recommendations and remedial programs	22
Referrals to Justice Department for Prosecution Under Section 11 (Oil Pollution) — (See Appendix C)	24
Enforcement Actions Under the Refuse Act of 1899	323
Civil Actions Referred to Justice Department by EPA Headquarters and Regional Offices (Appendix D)	97
Criminal Actions Referred to Justice Department by EPA Headquarters and Regional Offices (Appendix E)	143
Non-filing of Section 13 Permit Application Cases Referred to Justice Department by EPA (Appendix F)	83
Total water enforcement actions	568

*Excludes 4 additional referrals to Justice Department on expiration of the 180-day notice period.

VI. State and Local Water Pollution Control Programs

The primary rights and responsibilities of the States in water pollution control are explicitly recognized in the Federal Water Pollution Control Act. To assist the States in exercising these rights and responsibilities, EPA provides a broad range of program activities, including financial and technical assistance, research, planning and regulation. The status of State programs, Federal assistance provided, and a discussion of the role of the States in water pollution control are presented below.

STATE PROGRAM GRANTS FOR FISCAL YEAR 1972

Federal authorizations for State water pollution control program grants have grown from $3 million for FY1957 to $15 million for FY1972. The grants are based on annual State program submissions, which are evaluated to determine (1) their consistency and compatibility with regional and national water policies and objectives and (2) the feasibility of achieving expected results taking into consideration implementation problems. The grants are used to support many State and interstate programs, including those dealing with permits, municipal facilities, operation and maintenance, planning, enforcement, monitoring, training, water quality standards, research and development and administration.

The Federal and State funds allocated for pollution control programs for FY1972 are presented by program element as follows (in millions):[1]

Planning and water quality criteria	$ 8.2
Water pollution control facilities	11.6
Other programs	4.6
Surveillance	14.0
Enforcement	5.9
Executive and auxiliary	7.4
Total	51.7

The expenditures for these program elements are summarized in Table 1 by States. The summary shows that the States, on an average, expended nearly 3 dollars of State funds for each dollar received through Federal assistance.

State Activities Changed in FY1972. The major areas of expansion and/or change by State agencies were in the areas of surveillance, planning, water pollution control facilities, and other programs (certification, training, feedlots, mine drainage, oil field brine, etc.). Table 2 indicates program changes by State.

The major changes in planning and water pollution control facilities were associated with metropolitan/Basin plans, and with the national permit system. Changes in other programs involved mainly the mandatory certification of waste treatment plant operators and the training of qualified operators in methods of water quality control. Surveillance included an expansion in quality and quantity of monitoring equipment and laboratory facilities.

Areas Where EPA Assistance was Needed to Complement and Support State Activities and Goals. The States in their annual program submissions listed the areas where Federal assistance was most needed. Table 3 indicates that research and development, planning, and other programs were the major areas needing assistance in FY1972. These requests reflect both financial and technical needs.

[1] These funds were supplemented during fiscal year 1972 by $5 million in Federal funds, and $1.8 million in additional State and local funds, raising the total to $58.5 million. (See Table 1 for breakdown by States.)

TABLE 1

FY 1972 EXPENDITURES – WATER QUALITY PROGRAMS*

	Federal	State	Total
Region I			
Connecticut	$251,250	$453,731	$704,981
Maine	95,400	521,512	616,912
Massachusetts	401,700	1,132,363	1,534,063
New Hampshire	97,350	555,535	652,885
Rhode Island	163,200	219,100	382,300
Vermont	66,300	339,989	406,289
NEIWPCC†	132,450	134,900	267,350
Region II			
New Jersey	468,300	912,936	1,381,236
New York	968,100	4,665,269	5,633,369
Puerto Rico	288,750	144,000	432,750
Vir. Islands	109,800	36,600	146,400
I.S.C.‡	207,450	241,615	449,065
Region III			
Delaware	129,000	238,300	367,300
Dist. of Col.	130,200	388,224	518,424
Maryland	275,850	1,793,990	2,069,840
Penna.	734,100	2,731,000	3,465,100
Virginia	312,600	1,178,490	1,491,090
West Virginia	161,400	530,631	692,031
D.R.B.C.**	200,250	487,354	687,604
INCOPOT††	76,800	94,728	171,528
Region IV			
Alabama	277,350	158,750	436,100
Florida	415,200	836,603	1,251,803
Georgia	320,700	675,200	995,900
Kentucky	246,000	344,950	590,950
Mississippi	205,800	173,852	379,652
N. Carolina	387,600	614,778	1,002,378
S. Carolina	226,500	468,629	695,129
Tennessee	306,450	778,100	1,084,550
Region V			
Illinois	646,350	1,791,248	2,437,598
Indiana	350,700	535,024	885,724
Michigan	540,150	1,556,895	2,097,045
Minnesota	237,000	1,385,002	1,622,002
Ohio	671,700	1,085,041	1,756,741
Wisconsin	299,250	1,709,800	2,009,050
ORSANCO‡‡	283,050	198,400	481,450
Region VI			
Arkansas	168,900	345,500	514,400
Louisiana	269,400	428,641	698,041
New Mexico	79,650	183,814	263,464
Oklahoma	177,000	263,710	440,710
Texas	636,900	3,668,346	4,305,246

TABLE 1 (Continued)

	Federal	State	Total
Region VII			
Iowa	$ 184,950	$ 170,400	$ 355,350
Kansas	143,850	478,100	621,950
Missouri	296,100	249,972	546,072
Nebraska	101,550	173,023	274,573
Region VIII			
Colorado	136,350	341,415	477,765
Montana	59,250	195,381	254,631
North Dakota	56,100	31,100	87,200
South Dakota	58,350	58,014	116,364
Wyoming	36,300	47,800	84,100
Utah	84,150	136,714	220,864
Region IX			
Arizona	115,200	81,310	196,510
California	1,008,000	4,934,000	5,942,000
Guam	111,450	65,505	176,955
Hawaii	103,500	330,900	434,400
Nevada	38,250	36,200	74,450
Region X			
Alaska	30,600	127,900	158,500
Idaho	65,850	216,552	282,402
Oregon	148,350	649,585	797,935
Washington	205,950	1,157,700	1,363,650
Total	$15,000,000***	$43,484,121†††	$58,484,121

*Does not include expenditures for construction of waste water treatment facilities.
†New England Interstate Water Pollution Control Commission.
‡Interstate Sanitation Commission (New York, New Jersey, Connecticut).
**Delaware River Basin Commission.
††Interstate Compact for the Potomac River Basin.
‡‡Ohio River Valley Water Sanitation Commission.
***26 percent of total expenditures.
†††74 percent of total expenditures.

Man-years Assigned to Water Pollution Control. Total man-years assigned to water pollution control by the States for FY1972 are as follows:

Planning and water quality criteria	496.45
Water pollution control facilities	833.98
Other programs	260.62
Surveillance	972.50
Enforcement	432.58
Executive and auxiliary	450.23
Total	3,446.36

Reported manpower allocations have increased by 87 percent during the period from FY1968 through FY1972. The bulk of the increase has been in activities related to water pollution control facilities and surveillance.

MUNICIPAL WASTE WATER TREATMENT WORKS GRANTS FOR FY1972

National attention has been focused on the expanding need for municipal waste treatment facilities since enactment of the first permanent Federal Water Pollution Control Act in 1956. That Act initiated the program to provide Federal grant assistance to communities to

TABLE 2

PROGRAM AREAS IN WHICH ACTIVITIES WERE CHANGED DURING FY 1972, BY STATE

State	Planning	Water quality criteria	Water pollution control facilities	Other programs*	Surveil-lance	Enforce-ment	Research and development
Alabama	X						
Alaska	X					X	
Arizona	X		X		X	X	
Arkansas	X		X		X		
California	X	X		X	X		
Colorado	X	X	X		X		
Connecticut		X	X				
Delaware	X	X	X	X			
District of Columbia				X	X	X	X
Florida		X		X		X	
Georgia	X		X		X		
Hawaii		X	X	X			
Idaho	X	X		X	X		
Illinois	X	X	X	X			
Indiana		X		X	X	X	
Iowa					X	X	
Kansas	X			X			
Kentucky	X			X	X		
Louisiana	X	X	X				
Maine						X	
Maryland			X	X			
Massachusetts	X		X		X	X	
Michigan		X	X	X	X		
Minnesota	X		X		X		
Mississippi				X	X	X	
Missouri			X	X	X	X	
Montana			X	X		X	
Nebraska			X	X	X		X
Nevada	X		X				
New Hampshire	X		X	X	X		
New Jersey	X			X	X	X	
New Mexico			X		X		
New York				X			

TABLE 2 (Continued)

State	Planning	Water quality criteria	Water pollution control facilities	Other programs*	Surveil-lance	Enforce-ment	Research and development
North Carolina	X		X	X	X		
North Dakota		X	X	X	X		
Ohio		X			X	X	
Oklahoma	X			X	X		X
Oregon		X		X	X		
Pennsylvania	X	X	X			X	X
Rhode Island			X	X	X		
South Carolina					X		
South Dakota	X	X	X		X	X	
Tennessee				X			
Texas		X			X	X	
Utah	X	X	X	X	X	X	
Vermont			X				
Virginia	X				X		
Washington				X			
West Virginia	X	X	X	X		X	
Wisconsin	X	X	X	X	X	X	
Wyoming	X			X	X		
Guam	X		X	X			
Puerto Rico	X			X	X		
Virgin Islands			X	X			
Total	30	20	30	33	33	19	4

*Includes programs such as those concerned with certification, training, feedlot pollution and mine drainage.

improve or construct sewage treatment facilities. Subsequent amendments have helped accelerate plant construction by making more money available on a more liberal basis.[1]

Since 1957, the Federal government has provided $5.3 billion for construction and expansion of more than 13,700 municipal waste treatment projects. These funds have assisted States and communities in the construction of $14.5 billion of treatment works. In the construction of these works the States and communities spent nearly 2 dollars for each dollar received in Federal assistance. Table 4 summarizes the Federal expenditures for these plants, by fiscal year, from 1957 through 1972. The table shows that more funds have been obligated in the last 2 years than were obligated in the preceding 14 years.

[1]See Chapter I for evolution of the grant program.

TABLE 3

PROGRAM AREAS WHERE EPA ASSISTANCE WAS NEEDED IN FY 1972 TO COMPLEMENT AND SUPPORT ACTIVITIES AND GOALS

State	Planning	Water quality criteria	Water pollution control facilities	Other programs*	Surveil-lance	Enforce-ment	Research and development
Alabama	X				X		
Alaska					X		X
Arizona		X	X				
Arkansas							
California			X	X			X
Colorado	X			X			
Connecticut			X	X			X
Delaware				X			X
District of Columbia				X			
Florida	X			X	X	X	X
Georgia				X			X
Hawaii				X			
Idaho	X			X			X
Illinois				X			
Indiana				X		X	
Iowa				X			
Kansas				X			
Kentucky	X			X			
Louisiana	X			X			
Maine					X	X	
Maryland			X				
Massachusetts							
Michigan				X	X		
Minnesota				X		X	
Mississippi				X			
Missouri				X			
Montana				X			X
Nebraska	X			X	X		
Nevada	X		X	X			X
New Hampshire			X				
New Jersey			X	X			
New Mexico							
New York				X			

TABLE 3 (Continued)

State	Planning	Water quality criteria	Water pollution control facilities	Other programs*	Surveil-lance	Enforce-ment	Research and development
North Carolina				X			
North Dakota			X				X
Ohio					X		X
Oklahoma	X	X		X	X		
Oregon			X	X			X
Pennsylvania	X		X	X	X		X
Rhode Island				X			X
South Carolina	X			X			
South Dakota	X			X			
Tennessee				X	X		X
Texas	X		X				X
Utah	X		X	X			X
Vermont							
Virginia	X		X	X			X
Washington				X			
West Virginia	X		X	X			
Wisconsin	X	X	X	X			
Wyoming	X	X	X	X	X	X	X
Guam				X			
Puerto Rico	X			X			X
Virgin Islands				X	X		
Total	19	4	16	41	12	5	20

*Includes programs such as those concerned with certification, training, feedlot pollution and mine drainage.

The 1972 amendments have greatly expanded the Federal role in financing construction of municipal waste water facilities: The Federal share has been increased from a maximum of 55 percent to 75 percent; Federal grants up to $18 billion are authorized over the next three years; and an additional $2.75 billion is authorized to reimburse local governments for treatment plants constructed earlier in anticipation of Federal grants.

State allocations and obligations for FY1972 construction grant funds are listed in Table 5. The table shows that as of December 31, 1972, virtually all of the $2 billion appropriated had been obligated.

ROLE OF THE STATES

EPA recognizes the primary rights and responsibilities of the States in water pollution control. Below are listed the more important activities to be performed by the States in carrying out their responsibilities.

Planning and Monitoring. States are responsible for section 303(e) statewide water quality

TABLE 4

MUNICIPAL WASTE WATER TREATMENT WORKS CONSTRUCTION GRANTS
ANNUAL AUTHORIZATIONS, APPROPRIATIONS, OBLIGATIONS & EXPENDITURES

Fiscal year	Authorized appropriation	Actual appropriation	Fiscal year obligations	Expenditures*
1957	$ 50,000,000	$ 50,000,000	$ 50,000,000	$ 844,000
1958	50,000,000	45,657,000†	45,657,000	16,884,000
1959	50,000,000	46,816,000†	46,816,000	36,429,000
1960	50,000,000	46,101,000†	46,101,000	40,295,000
1961	50,000,000	45,645,260†	45,645,260	44,085,000
1962	80,000,000	80,000,000	80,000,000	42,103,000
1963	90,000,000	90,000,000	90,000,000	51,738,000
1964	100,000,000	90,000,000	89,642,425	66,432,000
1965	100,000,000	90,000,000	88,225,123	69,755,000
1966	150,000,000	121,000,000	120,946,373	81,479,000
1967	150,000,000	150,000,000	150,000,000	84,476,000
1968	450,000,000	203,000,000	203,000,000	122,109,000
1969	700,000,000	214,000,000	214,000,000	134,530,000
1970	1,000,000,000	800,000,000	800,000,000	176,377,000
1971	1,250,000,000	1,000,000,000	997,000,000‡	478,366,000
1972	2,000,000,000	2,000,000,000	2,000,000,000‡	413,407,888
Total	6,320,000,000	5,072,219,260	5,067,033,181	1,859,309,888

*Payments during fiscal year period.
†Includes supplemental requests and appropriations of $657,000 in 1958, $1,816,000 in 1959, $1,101,000 in 1960 and $645,260 in 1961.
‡Estimated to nearest million dollars.

TABLE 5

MUNICIPAL WASTE WATER TREATMENT WORKS CONSTRUCTION GRANTS
SUMMARY OF UTILIZATION OF FISCAL YEAR 1972 APPROPRIATED FUNDS
AS OF DECEMBER 31, 1972

State	Allocations	Obligations
Alabama	$ 33,785,150	$ 33,785,150
Alaska	3,548,000	3,548,000
Arizona	17,695,750	17,695,750
Arkansas	19,418,050	19,418,050
California	189,541,250	189,541,250
Colorado	21,738,150	21,738,150
Connecticut	29,350,500	29,350,500
Delaware	5,921,650	5,921,650
District of Columbia	7,800,150	7,800,150
Florida	65,134,450	65,134,450

TABLE 5 (Continued)

State	Allocations	Obligations
Georgia	$ 44,438,400	$ 44,438,400
Hawaii	8,074,300	8,074,300
Idaho	7,781,900	7,781,900
Illinois	105,887,000	105,887,000
Indiana	49,976,950	48,169,170
Iowa	27,588,850	27,588,850
Kansas	22,146,850	22,146,850
Kentucky	31,538,750	31,538,750
Louisiana	35,551,850	35,551,850
Maine	10,403,050	10,403,050
Maryland	37,871,250	37,871,250
Massachusetts	54,569,050	54,569,050
Michigan	84,756,550	84,756,550
Minnesota	36,850,650	36,850,650
Mississippi	22,346,700	22,346,700
Missouri	45,134,550	45,134,550
Montana	7,534,600	7,534,600
Nebraska	14,898,500	14,898,438
Nevada	5,326,250	5,326,250
New Hampshire	7,846,750	7,846,750
New Jersey	68,549,450	68,549,450
New Mexico	10,670,500	10,670,500
New York	172,839,550	172,839,550
North Carolina	49,155,750	49,155,750
North Dakota	6,876,100	6,874,568
Ohio	101,621,800	101,621,800
Oklahoma	25,212,500	25,212,500
Oregon	20,638,000	20,638,000
Pennsylvania	112,444,900	112,444,900
Rhode Island	9,770,100	9,770,100
South Carolina	25,694,050	25,694,050
South Dakota	7,308,800	7,308,796
Tennessee	38,227,450	38,227,450
Texas	106,900,250	106,900,250
Utah	11,030,650	11,030,639
Vermont	5,137,200	5,137,200
Virginia	44,914,250	44,914,250
Washington	33,037,650	33,037,650
West Virginia	17,657,050	17,657,050
Wisconsin	42,646,650	42,499,350
Wyoming	4,049,450	4,042,922
Guam	2,172,000	2,172,000
Puerto Rico	27,032,550	27,032,550
Virgin Islands	1,957,500	1,957,500
Total	$2,000,000,000	$1,998,036,783

planning.[1] In this planning they classify water body segments as either water-quality limited or effluent-guidelines limited. On water-quality-limited segments, they make load allocations, prepare section 303(e) full plans, and perform monitoring and analysis where required. On effluent-guidelines-limited segments they prepare section 303(e) management plans.

The States are also responsible for reviewing the development of section 208 areawide waste treatment management plans by local agencies. State review is to ensure adequacy, completeness, and compatibility with the overall process developed to implement the Federal Water Pollution Control Act.

States prepare an annual report that describes (1) the interim goals to be achieved during the year (based on past progress and the ultimate goals of their section 303(e) plans), (2) the State resources to be assigned in meeting the goals, and (3) the method of assigning resources. These reports help EPA set program priorities, and allocate financial and other assistance to the States.

Permits. The effluent discharge permit program will be transferred to the greatest extent possible to State authorities. Where transfer does not occur, EPA, while issuing the permits, will

[1] See Chapter II for greater detail.

States share responsibility with the Federal Government for enforcement. (A biologist of the State of Illinois investigates a fishkill.)

engage in a cooperative program with the States to mutually prepare permit conditions, supported by any State analyses performed under section 303(e) statewide planning.

Municipal Programs. States have responsibility for developing their construction grants priority lists. In exercising this responsibility, through review of plans and specifications for treatment works, the role of the States will be enhanced. Primary responsibility for seeing that treatment plants operate correctly also belongs to the State.

Enforcement. States share responsibility with the Federal Government for enforcement. The Federal role is a backup role—where States cannot maintain an adequate enforcement level, the Federal Government will ensure enforcement.

Nonpoint Sources. Nonpoint-source pollution control is basically a State responsibility. States are responsible for the planning, development and implementation of appropriate control strategies. In the development of such strategies, it is expected that the States will consider the special relation of nonpoint-source pollution to lake eutrophication. In those areas where deep-well disposal is practiced, States will be expected to develop disposal control programs.

VII. Efficiency of Treatment Works

The 1972 amendments authorize $18 billion over the 3 fiscal years ending mid-1975 to help local governments build sewage treatment plants. In order that the planners of such plants may benefit from the performance of existing facilities, EPA conducts annual surveys of plant efficiencies. The surveys, required by Section 210, take into consideration the planned as well as the actual efficiency of plant operations and maintenance.

PROCEDURES FOR ACCOMPLISHMENT

The ongoing EPA operation and maintenance (O&M) program includes an operational compliance inspection effort on all projects assisted by Federal grants. The inspections are accomplished by EPA regional staff engineers or State regulatory agency engineers. Currently, inspections are conducted near the end of the first year of new plant operation, but the initial efforts 4 years ago included a sizeable number of older plants.

The results of these inspections for the last 4 years are contained in a computer file, Sewage Treatment Plant Operation and Maintenance Data Base (STPOM), which has been the basic data source used in developing information for the O&M efficiency survey. The STPOM data file contains operational data, but insufficient design data, on approximately 1,400 grant-funded plants.

The file was searched and a selection made of plants with operating data usable for the purposes of the efficiency survey. Of the 1,400 plant data files examined, 470 were found to have insufficient operational data to permit the desired efficiency comparisons and were deleted from the survey. These included primarily smaller plants, which have reported little or no operational performance testing. The remaining 930 projects were referred to the 10 EPA regional offices for development of original design data. Additional projects were deleted during this phase, as described later under "Problems." The final group of projects was examined by coding operation data, design data, and other information into a computer. Various printouts were obtained in the development of the comparisons and in analyzing problem areas. Results of the analyses are presented below.

DATA ANALYSIS

Plants Analyzed. Records of approximately 1,400 plants (10 percent of all grant-funded plants) were examined, but only 48 percent contained sufficient information to accomplish an analysis. Comparisons were made on a sample of some 670 plants, distributed throughout the nation, that included all sizes and types. Table 1 is a display of the sample by size groupings and by type of principal process.

Efficiency Compared to Design. Operational data for conducting the efficiency comparison were taken from plant operational records at the time of the EPA or State inspection (conducted some time between 1968 and 1972, inclusive). The data included the annual average percentage removal of biological oxygen demand (BOD_5), suspended solids and settleable solids, and the average flow for the 12-month period preceding the inspection. These values were directly compared with those determined to be applicable to the original design.

The principal results of the survey can be summarized as follows:

- Compared to original design criteria
  - 67 percent of all plants surveyed were meeting the original design criteria for removal of BOD_5
  - 55 percent were meeting design criteria for suspended solids removal
  - 70 percent were meeting design criteria for settleable solids removal
- For those plants not meeting design criteria, the average deviation below design

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TABLE 1

NUMBER OF PLANTS ANALYZED, BY SIZE AND PRINCIPAL PROCESS

Principal process	Group 1 (15+ mgd*)	Group 2 (5-14.99 mgd)	Group 3 (1-4.99 mgd)	Group 4 (0-0.99 mgd)	Total
Primary	10	13	30	42	95
Lagoons	---	2	4	42	48
Trickling filter	4	19	98	119	240
Activated sludge	6	20	57	204	287
Total	20	54	189	407	670

*Million gallons per day.

EPA conducts treatment plant efficiency surveys so that planners may benefit from the performance of operating facilities. (Citizens protest against their town's inadequate sewage disposal system)

An efficient waste treatment plant located at Lake Tahoe, California. (EPA-DOCUMERICA–BELINDA RAINS)

was nine percentage points of BOD_5 removal.

- For those plants meeting or exceeding design criteria, the average deviation above design was six percentage points of BOD_5 removal.
- For all plants, the average actual removals were:

BOD_5	79%
Suspended solids	77%
Settleable solids	96%

Table 2 shows the number of plants that do and do not meet design criteria for BOD_5 removal, by size and principal process. The deviation below design is shown for those plants that do not meet design. The table shows that a higher percentage of small plants than large plants is meeting design criteria. Such a conclusion should be moderated by an appreciation of the fact that laboratory test data for small plants are normally accomplished with less expertise and at a lesser sampling and analysis frequency than for large plants. Table 2 also indicates a striking uniformity of deviation of those plants not meeting design, regardless of size or type.

Average Removal Efficiencies. The average removal efficiencies for each process type and size grouping are shown in Table 3. The average design values are also shown for comparison.

This survey has determined that 33 percent of the individual plants examined are not meeting their design efficiency in terms of BOD_5 removal. Table 3 shows, however, that the average actual percent of BOD_5 removal for all plants slightly exceeds the average design values. This is not true for suspended solids. In fact, in the case of lagoons, there is an average deviation of 14 percentage points below average design values for suspended solids removal.

Plant Problems. The survey revealed that in

TABLE 2

NUMBER OF PLANTS MEETING DESIGN CRITERIA FOR BOD_5 VS. NUMBER OF PLANTS NOT MEETING DESIGN

[Based on BOD_5 Removals]

Type of process	Group 1 (15+ mgd*)				Group 2 (5-14.99 mgd)				Group 3 (1-4.99 mgd)				Group 4 (0-0.99 mgd)				All groups			
	Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting		Meeting		Not meeting	
	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†	No.	%	No.	Deviation†
Primary	5	50	5	13	6	46	7	9	20	67	10	10	27	64	15	11	58	61	37	11
Lagoons	---	---	---	---	1	50	1	5	2	50	2	8	31	74	11	9	34	71	14	8
Trickling filter	4	100	---	---	7	37	12	8	57	58	41	9	75	63	44	9	143	60	97	9
Activated sludge	2	33	4	4	13	65	7	8	43	75	14	8	153	75	51	10	211	73	76	9
Total/average	11	55	9	9	27	50	27	8	122	65	67	9	286	70	121	9	446	67	224	9

*Million gallons per day.
†Equals average deviation below design, in percentage points of BOD_5 removal.

TABLE 3

AVERAGE PERCENT REMOVAL (ACTUAL)

Size of plant	Type of process														
	Primary			Lagoons			Trickling filter			Activated sludge			All plants		
	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids	BOD_5	Suspended solids	Settleable solids
Group 1 (15+ mgd*)	35	58	96	—	—	—	94	91	97	87	80	83	62	71	93
Group 2 (5-14.99 mgd)	33	60	93	84	75	—	83	82	93	89	87	96	73	78	94
Group 3 (1.0-4.99 mgd)	41	59	98	84	76	99	83	78	95	88	84	96	78	76	96
Group 4 (0.0-0.99 mgd)	39	62	95	85	68	90	84	81	97	89	84	96	82	79	96
Average removals (%)	38	60	96	85	70	91	83	80	96	89	84	96	79	77	96
Average design values	36	55	93	83	84	98	84	83	98	87	87	98	78	80	97

*Million gallons per day.

the plants that do not meet design, certain problems could be identified:

- 20 percent were hydraulically overloaded.
- 40 percent were affected by infiltration problems during wet weather.
- 14 percent had a structural problem.
- 41 percent had a temporary mechanical failure.
- 49 percent had an operational problem (improper operation and/or need to upgrade training of operators).
- 24 percent were found to provide inadequate laboratory testing.
- 17 percent were rated fair or poor in the area of general maintenance.

Of those plants not meeting design, it was reported that 44 percent were faced with pending action by the State regulatory agency. In a similar EPA survey a year ago, a recheck determined that within 1 year of inspection, 25 percent of the deficiencies had been corrected through follow-up actions of State agencies or EPA regional offices.

GENERAL PROBLEMS

Deficiencies in Plant Sampling and Laboratory Analysis. As previously mentioned, some 470 inspection data files did not include sufficient operational data to accomplish the desired efficiency comparison and were deleted from the survey. The principal reason for lack of operational data was the failure of some plants

to conduct sampling and laboratory testing. This failure was largely restricted to the smaller plants of less than 1 million gallons per day capacity. The operators of such plants may have been unduly influenced by a guidance manual issued in 1963 which suggested that only settleable solids tests be conducted for small plants. Also, the FY 1972 *EPA Digest of State Programs* shows that 10 States do not require monthly reporting of operating results, a fact that quite likely affects the degree of sampling and testing performed in those States. In a few cases, the survey used data from grab samples tested by State agencies in the absence of routine testing by the plant staff.

Within the limited time available to conduct this survey, it was not possible to confirm the accuracy or validity of the plant operational data. It was necessary to use the operational data already available in the computer file from the grant compliance inspection program. As a result, the figures cited for the small plants of less than 1 million gallons per day capacity, may be based on very limited analytical data (in some cases, only one grab sample). For the larger plants, however, the data base is generally much better and there is good assurance that the information presented represents actual conditions for the plants inspected.

Availability of Design Criteria. As previously stated, a listing of 930 projects from the STPOM file were referred to EPA regional offices for determination of original design criteria. The design criteria were not available for a number of plants for the following reasons:

- For many years, it has been a fairly common practice to design municipal wastewater plants on the basis of the type of process utilized (standard rate trickling filter, conventional activated sludge, extended aeration, etc.). To each of these processes a general range of annual average removal efficiencies was ascribed. There was no definable single numerical value by which plant performance could be measured. Only very recently have design engineers begun to identify design intent in specific terms (presumably in response to 40 CFR 35.835-4, June 9, 1972, which requires a minimum removal of 85 percent of BOD_5).
- The limited time available for this study, and other constraints, precluded a search of State files of each project to secure the original design criteria. The search was restricted to data currently available within the 10 EPA regional offices. Where original design criteria was available for a specific plant, that data has been used. For those projects for which data retrieval was not feasible, an evaluation of applicable State requirements was made. If a clearly identifiable State requirement for design efficiencies existed at the time of original approval, then those criteria were used.

STATUS

Deficiencies in Plant Sampling and Laboratory Analysis. There are several actions currently underway by EPA in the implementation of the 1972 amendments that will directly improve the sampling, testing, and reporting activities of plant operations. Regulations and guidelines in various stages of development will accomplish this through (1) elements of the National Pollutant Discharge Elimination System, (2) establishment of effluent limitations under section 301, (3) definition of the effluent reduction attainable by application of secondary treatment under section 304, (4) improved operation and maintenance functions within State program plans, and (5) grant eligibility requirements under Title II. The ongoing development of source documents by EPA for guidance in plant staffing, laboratory staffing, minimum sampling and testing procedures, and model State operation and maintenance programs will provide overall detailed information for improved operational control. The present computer file will be expanded to include data from an additional 1600 plants within 6 months.

Availability of Design Criteria. Steps have been taken to improve the availability of design data. Further, the FY1974 study effort will permit sufficient time to secure design data from additional sources to supplement existing regional files. Regulations and guidelines in various stages of promulgation or development will provide for the clear identification of intended design efficiencies in project submissions and reviews in the future.

Plant Problems. The general existence of the deficiencies reported has been known for some time and was the basis for organizing in 1968 operation and maintenance programs and staffs

at headquarters and regional levels. Many of the program elements initiated then and since are just now beginning to have an impact on the problems through source documents, guidelines, and manuals. Program needs are being coordinated agencywide in a number of areas, including research, manpower development and training, State programs, and construction grants. Existing efforts will be expedited and enhanced greatly by regulations now being promulgated (as mandated by FWPC Act) covering permits, pretreatment standards, effluent limitations, state programs, and grant eligibility requirements. Increased sampling and reporting of operational efficiencies, more frequent inspections, more positive follow-up actions, upgrading of operational personnel and facilities, and higher standards nationally are expected to accomplish direct and lasting correction of the principal deficiencies now identified.

VIII. Manpower Programs

The effectiveness of water quality control programs will be influenced to a major degree by the availability of skilled manpower. This manpower will be needed in the Federal, State, and private sectors of the economy and will involve skill levels that vary from complex professional specialties to simple manual operational tasks.

Because of the major changes in the national water pollution effort, the first manpower implementation activity that must be completed is a detailed analysis of the impact of the new legislative requirements on the national manpower pool. Such an analysis must identify both manpower shortages and skill deficiencies. The identified needs must then be assessed in terms of costs and feasibility of action.

In addition to a program for identifying specific needs, EPA has a series of manpower and training programs designed to affect the areas of identified deficiency. These programs are described below in summary fashion.

MANPOWER PLANNING

The existing manpower planning program is designed to develop the capability of Federal, State, and local agencies to determine and meet their manpower and training needs.

Accomplishments. Manpower planning capability has been established in more than 30 States. The Department of Labor has issued an interagency instruction encouraging the establishment of linkages between the water pollution control agency manpower planner and the manpower planning coordinating staffs in the offices of governors and mayors. The Office of Education is supporting the training of 200 manpower planners from Federal, State, and local agencies in planning for wastewater treatment plants. Occupational definitions and staffing guides have been developed or are being developed for wastewater treatment plants, collection systems, and State agencies. A priority has been placed on improvement of operator certification practices of State agencies. EPA, with support of the American Water Works Association and the Water Pollution Control Federation, made the following accomplishments in this area: (1) a model State law was developed and promulgated by the Council of State Governments; (2) a national certification authority (Association of Boards of Certification) to promote improved and consistent certification practices among State agencies has been established; and (3) a body of guidelines for the administration of State certification programs was developed and issued. In cooperation with State agencies, professional and employer associations, and other EPA organizations, a series of manpower demand and supply studies has been completed, started, or planned to cover all sectors of the water pollution control program.

MANPOWER TRAINING

Operator Training for Municipal Waste Treatment. The primary objective of this program is to foster an adequate supply of skilled manpower to properly operate, maintain, and monitor existing and future water and wastewater treatment facilities and collection systems. Operator training programs to provide additional personnel for new plants and to improve the effectiveness of operators in plants with operating deficiencies will be provided on the basis of priority basin needs.

Undergraduate Training (Section 109a and 110-112). The undergraduate training program is designed to prepare students for work relating to the design, operation, and maintenance of treatment plants and other related facilities. Curriculum development projects and pilot training programs have been implemented in a limited number of schools. Three schools[1] with 100

[1]Charles Country Community College (Maryland), Greenville Technical center (South Carolina), Linn-Benton Community College (Oregon).

trainees conduct 2-year training programs for plant operators, and the University of Wisconsin conducts a 4-year engineering design program for 20 trainees.

Direct Technical Training. EPA provides direct technical training to help meet the short term needs of Federal, State, or municipal agencies responsible for implementing the new water quality legislation. Priority will be given to personnel with responsibilities for improving water quality in the 89 critical basin areas.

Professional Training. Demand for personnel in the professional category will continue to increase, primarily as a result of expanded construction grants, State planning and administration programs, and a broad range of research needs. The Agency's professional training grant program has been a source of funding for the preparation of advanced professionals entering the field of water quality management.

ESTIMATE OF MANPOWER NEEDS

Although special manpower planning studies must be completed before detailed estimates of the manpower implication of the 1972 amendments can be fully assessed, existing information provides a general measurement of possible need. The last national manpower estimate is summarized in Table 1. This estimate forecasts a large increase in manpower and training needs, but it can be considered conservative, since it does not consider the specific requirements of the new water quality legislation.

TABLE 1

ADDITIONAL MANPOWER REQUIRED BY 1976*

Personnel category	Sector					Total for 1976
	Nongovernment	Local	State	Federal (non-EPA)	EPA	
Professional	10,200	1,300	3,400	1,300	600	16,800
Operator	33,300	8,900	—	1,400	—	43,600
Technician	18,400	1,200	400	200	200	20,400
Other	10,400	11,700	800	400	600	23,900
Total	72,300	23,100	4,600	3,300	1,400	104,700

*Source: *A Report to Congress on Water Pollution Control Manpower Development and Training Activities* (Committee on Public Works Print 92-36 of March 1972).

IX. Waste Pollution Control Advisory Board

A Water Pollution Control Advisory Board has served since enactment of the first Water Pollution Control Act in 1948. The Board under present law consists of the Administrator or his designee who serves as Chairman, and nine non-Federal members appointed by the President for 3-year terms. The Board consults with, advises, and makes recommendations to the Administrator on matters of policy relating to water pollution control. During 1972 the Board held three meetings and developed findings and recommendations on animal wastes, land use, and ocean disposal.

ANIMAL WASTES

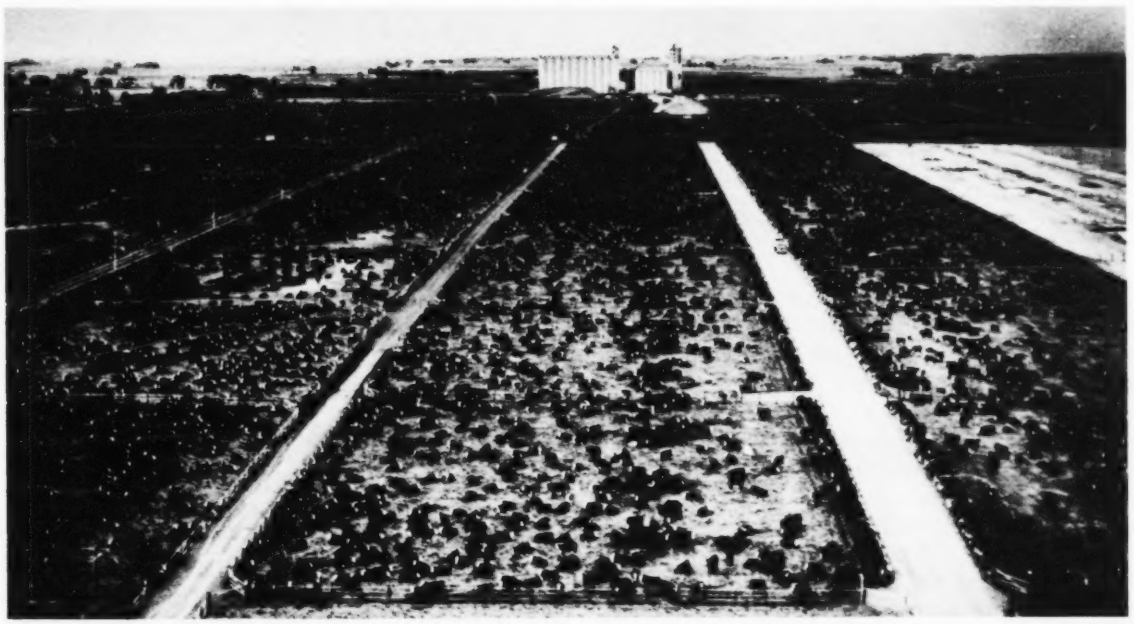
In late 1971 and early 1972, the Board undertook a review of problems relating to pollution of water resources by animal wastes. It toured agricultural areas in Colorado, Nebraska, Kansas, Illinois, and Indiana and conducted meetings to receive testimony from experts and interested citizens. In addition, the Board considered recommendations developed by a national symposium on animal waste management and by workshops conducted by several academic institutions. The Board's recommendations concerning animal wastes are presented in Appendix G.

LAND USE

The Water Pollution Control Advisory Board met jointly with the Air Quality Advisory Board (15 members appointed by the President for 3 year terms) to review relationships between environmental quality and land use. The Board toured areas of California from Lake Tahoe to Los Angeles. The recommendations of the two Presidential advisory boards are presented in Appendix G.

OCEAN DISPOSAL

The Board met in New York City during September 1972 to explore and make recommendations on the subject of ocean disposal. Based on (1) briefing by representatives of Federal, State, and local agencies, (2) a flyover to view sewage sludge dumping, dredge spoil dumping, and acid waste dumping in the New York Bight, and (3) a day of public testimony, the Board developed recommendations which are presented in Appendix G.



Recycling animal wastes back onto the land is the best practicable approach in most situations. (Feed lot near Greeley, Colorado where thousands of beef cattle are concentrated.)

Appendix A

FEDERAL WATER POLLUTION CONTROL ACT
WATER QUALITY STANDARDS VIOLATION NOTICES[1]
(12-3-70/10-18-72)

Item	Date of Letter	Date of Informal Hearing
City of Atlanta, Ga. (Chattahoochee River)	12/9/70	1/12/71
City of Detroit, Mich. (Detroit River—Lake Erie)	12/9/70	2/1/71
City of Cleveland, O. (Lake Erie)	12/9/70	1/28/71
City of Chicopee, Mass. (Connecticut River)	4/9/71	6/2/71
Piels Brothers, Inc., Chicopee, Mass. (Connecticut River)	4/9/71	6/2/71
City of Pepperell, Mass. (Nashua River)	4/9/71	6/3/71
Bemis Company, Inc., East Pepperell, Mass. (Nashua River)	4/9/71	6/3/71
St. Regis Paper Company, East Pepperell, Mass. (Nashua River)	4/9/71	6/3/71
Reserve Mining Company,[2] Silver Bay, Minn. (Lake Superior)	4/28/71	6/3/71[2]
Santa Fe Land Improvement Company, Kansas City, Kans. (Kansas River)	6/1/71	7/13/71
Holly Sugar Company, Torrington, Wyo. (North Platte River)	6/15/71	7/21/71
Ashland Oil and Refining Company, Ky. (Big Sandy River)	6/22/71	8/6/71 9/22/71[3]
City of Stamford, Conn. (Long Island Sound)	7/16/71	9/3/71
Town of Darien, Conn. (Long Island Sound)	7/16/71	9/3/71
City of Bogalusa, La. (Bogue Lusa Creek/Pearl River)	7/21/71	9/9/71
City of Euclid, O. (Lake Erie/Euclid Creek)	7/30/71	9/9/71
City of Willoughby, O. (Lake Erie) (Eastlake Sewage Treatment Plt)	7/30/71	9/9/71
City of Eastlake, O. (Lake Erie) (Eastlake Sewage Treatment Plt)	7/30/71	9/9/71
Beachwood, O. (Cleveland Sewer System/Lake Erie)	8/9/71	9/24/71
Bratenahl, O.	8/9/71	9/24/71
Cleveland Heights, O.	8/9/71	9/24/71
East Cleveland, O.	8/9/71	9/24/71
Gates Mills, O.	8/9/71	9/24/71
Lyndhurst, O.	8/9/71	9/24/71
Mayfield Heights, O.	8/9/71	9/24/71
Richmond Heights, O.	8/9/71	9/24/71
South Euclid, O.	8/9/71	9/24/71
Lakewood, O.	8/9/71	9/24/71
Brooklyn, O.	8/9/71	9/24/71
Brook Park, O.	8/9/71	9/24/71
Garfield Heights, O.	8/9/71	9/24/71
Maple Heights, O.	8/9/71	9/24/71
Newburgh Heights, O.	8/9/71	9/24/71
Warrensville Township, O.	8/9/71	9/24/71
Highland Heights, O.	8/9/71	9/24/71
Mayfield Village, O.	8/9/71	9/24/71
Shaker Heights, O.	8/9/71	9/24/71
University Heights, O.	8/9/71	9/24/71
Bedford Heights, O.	8/9/71	9/24/71
Brooklyn Heights, O.	8/9/71	9/24/71
Cuyahoga Heights, O.	8/9/71	9/24/71
Linndale, O.	8/9/71	9/24/71
Middleburg Heights, O.	8/9/71	9/24/71
North Randall, O.	8/9/71	9/24/71
Parma, O.	8/9/71	9/24/71
Seven Hills, O.	8/9/71	9/24/71
Parma Heights, O.	8/9/71	9/24/71
Warrensville Heights, O.	8/9/71	9/24/71
Franklin, N.H.	8/20/71	10/19/71
Vincennes, Ind. (Wabash River)	9/3/71	10/8/71

[1] 180-day notices under (former) Section 10 of the FWPC Act.

[2] As 180-day period did not result in an acceptable abatement plan, the U.S. Attorney was requested on 1/20/72 to prosecute in Federal Court; on 2/17/72, the Department of Justice filed suit for civil relief under the Refuse Act and under Section 10 of the FWPC Act (see Appendix D).

[3] Second hearing.

Item	Date of Letter	Date of Informal Hearing
City of Hurley, Wis. (Montreal River)	9/30/71	11/18/71
City of Superior, Wis. (Lake Superior)	9/30/71	11/17/71
Superior Fiber Products Co., Superior, Wis. (Lake Superior)	9/30/71	11/17/71
City of Whiting, Ind. (Lake Michigan)[4]	10/12/71	12/1/71[4]
City of Hammond, Ind. and Hammond Sanitary District (Lake Michigan, Grand Calumet River, Little Calumet River)	10/12/71	12/1/71
City of Dunkirk, N.Y. (Lake Erie)	10/22/71	12/1/71
City of Covington, Ind. (Wabash River)	11/3/71	1/5/72
City of Logansport, Ind. (Wabash River)	11/3/71	12/14/71
City of Montezuma, Ind. (Wabash River)	11/3/71	1/5/72
Tahoe-Douglas District, Nev.[5] (Lake Tahoe)	11/9/71	1/6/72[5]
Kingsbury General Improvement District, Nev.[5] (Lake Tahoe)	11/9/71	1/6/72[5]
Brown Paper Co., Castleton-on-Hudson, N.Y.	12/23/71	1/25/72
Patrician Paper Co., South Glens Falls, N.Y.	12/23/71	1/25/72
City of Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Clark County Sanitation District, Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
City of Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Nevada Power Co., Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Basic Management, Inc., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Kerr-McGee Chemical Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Stauffer Chemical Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Montrose Chemical Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
U.S. Lime Division, Flintkote Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Titanium Metals Corp. of America, Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Jones Chemical Co., Inc., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
State Stove & Manufacturing Co., Henderson, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Nevada Rock and Sand Co., Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Las Vegas Valley Water District, Las Vegas, Nev. (Las Vegas Wash)	12/23/71	1/25/72
Alton Box Board Co., Lafayette, Ind. (Wabash River)	1/28/72	3/1/72
National Sugar Refining Co., Philadelphia, Pa. (Delaware River)	2/1/72	2/14/72; 2d mtg
Sun Olin Chemical Co., Claymont, Del. (Middle Creek)	2/1/72	2/9/72
Sun Oil Co., Marcus Hook, Pa. (Delaware River)	2/1/72	2/29/72
American Sugar Refining Co., Philadelphia, Pa. (Delaware River)	2/1/72	2/24/72
FMC Corp., American Viscose Div., Marcus Hook, Pa.[6] (Marcus Hook Creek)	2/1/72	2/14/72; 2d mtg on 2/29/72[6]
GAF Corp., Gloucester City, N.J. (Delaware R.)	2/9/72	3/22/72
City of Garland, Utah (Malad River)	2/11/72	3/7/72
City of Tremonton, Utah (Malad River)	2/11/72	3/7/72
Great Western Sugar Co., Greeley, Colo. (Cache La Poudre Dr., trib. of So. Platte R.)	2/14/72	3/28/72
Great Western Sugar Co., Ovid, Colo. (So. Platte River)	2/14/72	3/29/72

[4] As 180-day period did not result in acceptable abatement plan, the U.S. Attorney was requested on 9/5/72 to prosecute in Federal Court under Section 10(g) of FWPCA.

[5] As 180-day period did not result in acceptable abatement plan, the U.S. Attorney was requested on 6/21/72 to prosecute in Federal Court under Section 10(g) of FWPCA.

[6] As 180-day period did not result in acceptable abatement plan, the U.S. Attorney was requested on 9/28/72 to bring civil suit under the Refuse Act.

Item	Date of Letter	Date of Informal Hearing
Washington Suburban Sanitary Commission, Md. (Potomac R.—Wash., D.C. Metro Area)	2/24/72	3/17/72
Federal Paper Board Co., Inc., Riegel Products Div., Milford, N.J. (Delaware R.)	3/6/72	3/26/72
Hudson, S.Dak. (Big Sioux River)	3/17/72	4/18/72
Great Western Sugar Company, Nebr. 4 co. Plants (Along North Platte River) At Gering, Scottsbluff, Bayard & Mitchell, Nebr.	4/27/72	5/23/72
City of Sheboygan, Wis. (Fox River to Green Bay/ Lake Michigan)	5/9/72	6/21/72
American Can Company, Green Bay Mill, Green Bay, Wis. (Fox River/Green Bay)	5/9/72	6/20/72
Charmin Paper Products Company, Fox River Mill, Green Bay, Wis. (Fox River/Green Bay)	5/9/72	6/20/72
Green Bay Metropolitan Sewerage District, Green Bay, Wis. (Fox River/Green Bay)	5/9/72	6/20/72
City of Montpelier, Ida. (Bear River)	5/17/72	6/13/72
City of Priest River, Ida. (Pend Oreille River)	5/17/72	7/11/72
City of Paul, Ida. (Tributary of Snake River)	5/17/72	7/5/72
City of Sandpoint, Ida. (Pend Oreille Lake)	5/17/72	6/10/72
New Orleans, La. (Mississippi River)	5/19/72	6/9/72
City of Lebanon, N.H. (Mascoma River—Tributary of Connecticut River)	6/1/72	6/29/72
E. Cummings Leather Company, Inc. Lebanon, N.H.	6/2/72	6/29/72
Yazoo City, Miss. (Yazoo River)	6/12/72	7/27/72
Natchez, Miss. (Mississippi River)	6/12/72	7/26/72
West Point, Ky. (Ohio River)	6/26/72	8/2/72
Crucible Steel Corporation, Geddes, N.Y. (Tributary of 5A of Lake Onandaga)	6/26/72	7/12/72
Henderson, Ky. (Ohio River)	6/26/72	8/1/72
W.R. Grace Company, Owensboro, Ky. (Ohio River)	6/29/72	8/1/72
New York City, N.Y. (New York Harbor & Adjacent Water)	7/18/72	
Passaic Valley Sewerage Commission (Upper Bay of New York Harbor)	7/18/72	
Gary Sanitary District, Gary, Ind. (Grand Calumet River, Indiana Harbor Canal, Lake Michigan)	7/28/72	9/7/72
Alaska Ice & Storage, Inc., Alaska (Kodiak Harbor)	8/2/72	9/7/72
Alaska Packers Association, Alaska (Kodiak Harbor)	8/2/72	9/7/72
B & B Fisheries, Inc., Alaska (Kodiak Harbor)	8/2/72	9/7/72
Columbia Ward Fisheries, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Eastpoint Seafood Company, Alaska (Kodiak Harbor)	8/2/72	9/7/72
King Crab, Inc., Alaska (Kodiak Harbor)	8/2/72	9/7/72
Kinnear & Wendt, Inc. (Kodiak Harbor)	8/2/72	9/7/72
New England Fish Co., Alaska Gibson Cove Plant (Kodiak Harbor)	8/2/72	9/7/72
New England Fish Co., Alaska Marine Way Plant (Kodiak Harbor)	8/2/72	9/7/72
Northers Processors, Alaska (Kodiak Harbor)	8/2/72	9/7/72
North Pacific Processors, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Pan Alaska Fisheries, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Roxanne Fisheries, Inc. (Kodiak Harbor)	8/2/72	9/7/72
Ursin Seafoods, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Whitney Fidalgo Seafoods, Alaska (Kodiak Harbor)	8/2/72	9/7/72
Borough of Edgewater, N.J. (Hudson River)	8/11/72	9/6/72
Town of West New York, N.J. (Hudson River)	8/11/72	9/6/72
Jersey City Sewerage Authority, Jersey City, N.J. (Hudson River and Newark Bay)	8/11/72	9/7/72
Town of Kearney, N.J. (Newark Bay)	8/11/72	9/7/72
City of Hoboken, N.J. (Hudson River)	8/11/72	9/12/72
City of Bayonne, N.J. (Kill Van Kull)	8/11/72	9/12/72
Township of North Bergen, N.J. (Hudson River)	8/11/72	9/12/72

Item	Date of Letter	Date of Informal Hearing
Wayne County, Mich. (Wyandotte Plant) (Trenton Channel-Detroit River)	8/29/72	10/17/72
City of Riverview, Mich. (Detroit River)	8/29/72	10/17/72
Knoxville, Tenn./Third Creek STP (Tennessee River)	9/10/72	10/7/72
City of Wildwood, N.J. (Grassy Sound/Atlantic Ocean)	9/12/72	
Borough of Wildwood Crest (Wildwood Crest, N.J.) (Richardson Sound)	9/12/72	
Middle Township Sewerage District #1, Cape May Court House, N.J. (Crooked Brook, Tributary of Hereford Inlet)	9/12/72	
Avalon Sewerage Authority (Great Sound) Avalon, N.J.	9/12/72	
City of North Wildwood (Hereford Inlet) North Wildwood, N.J.	9/12/72	
Ocean City, N.J. (Great Egg Harbor Bay)	9/12/72	
Borough of Stone Harbor Stone Harbor, N.J. (Great Channel)	9/12/72	
Sea Isle City (Ludlam's Thorofare) Sea Isle City, N.J.	9/12/72	
Borough of Avon-by-the-Sea (Atlantic Ocean) Avon-by-the-Sea, N.J.	9/12/72	
Borough of Bradley Beach (Atlantic Ocean) Bradley Beach, N.J.	9/12/72	
Borough of Neptune City (Atlantic Ocean) Neptune City, N.J.	9/12/72	
Borough of Neptune Township (Atlantic Ocean) Neptune Township, N.J.	9/12/72	
Ocean Grove Camp Meeting Assoc. of Meth. Church (Atlantic Ocean) Ocean Grove, N.J.	9/12/72	
Cuyahoga County Sewer District #6 (Lake Erie) (Rocky River Plant) Cleveland, O.	9/18/72	10/31/72
Cities Service Corporation (Ocoee River) Copperhill, Tenn.	10/2/72	
Menasha Corporation, John Strange Paper Co. (Fox River-Lake Michigan) Neenah, Wis.	10/5/72	11/28/72
Mead Corporation, Gilbert Paper Co. (Fox River-Lake Michigan) Menasha, Wis.	10/5/72	11/28/72
City of Menasha, Wis. (Fox River-Lake Michigan)	10/5/72	11/28/72
Kimberly-Clark Corporation (Fox River-Lake Michigan) (Lakeview Mill) Neenah, Wis.	10/5/72	11/28/72
Kimberly-Clark Corporation (Fox River-Lake Michigan) (Badger-Globe Mill) Neenah, Wis.	10/5/72	11/28/72
City of Neenah, Wis. (Fox River-Lake Michigan)	10/5/72	11/28/72
Neenah-Menasha Sewerage Commission (Fox River-Lake Michigan) Menasha, Wis.	10/5/72	11/28/72
City of Appleton, Wis. (Fox River-Lake Michigan)	10/5/72	11/29/72
Wisconsin Tissue Mills, Menasha, Wis. (Fox River-Lake Michigan)	10/5/72	11/28/72
George A. Whiting Paper Company (Fox River-Lake Michigan), Menasha, Wis.	10/5/72	11/28/72
Kimberly-Clark Corporation (Fox River-Lake Michigan) Neenah, Wis. (Neenah Paper Mill Div.)	10/5/72	11/28/72
Consolidated Papers, Inc. (Fox River-Lake Michigan) Appleton, Wis.	10/5/72	11/29/72
Bergstrom Paper Company (Fox River-Lake Michigan) Neenah, Wis.	10/5/72	11/28/72
Riverside Paper Company (Fox River-Lake Michigan) Appleton, Wis.	10/5/72	11/29/72
Granite City, Ill. (Mississippi River)	10/13/72	12/7/72
Village of Sauget, Ill. (Mississippi River)	10/13/72	12/6/72
The East Side Levee and Sanitary District, East St. Louis, Ill. (Mississippi River)	10/13/72	12/6/72
City of East St. Louis, Ill. (Mississippi River)	10/13/72	12/7/72
PPG INDUSTRIES (Caribe) Ponce, Puerto Rico (Guyanilla Bay)	10/16/72	

Appendix B

FEDERAL WATER POLLUTION CONTROL ACT ENFORCEMENT CONFERENCE-TYPE ACTIONS (12-3-70/9-30-72)

2/18-19/71 — Convened Second Session of *Dade County, Florida,* Enforcement Conference, at Miami, Florida.

2/23-24/71 — Reconvened Enforcement Conference for *Escambia River and Bay,* Alabama-Florida, at Pensacola, Florida.

2/25-26/71 — Reconvened Enforcement Conference for *Perdido Bay,* Florida-Alabama, at Pensacola, Florida.

3/2/71 — Approved Clean-up program for *Mobile Bay, Alabama,* calling for completion of abatement measures not later than 2/15/73 (Enforcement Conference had been held 1/27/28, 1970, at Mobile, Alabama).

3/23-25/71 — Reconvened Enforcement Conference for *Lake Michigan and its Tributary Basin, Wis-Ill-Ind-Mich,* to establish thermal discharge standards, at Chicago, Illinois.

4/5-7/71 — Held *Water Quality Standards-Setting Conference for the Interstate Waters of Alabama,* at Montgomery, Alabama (Sec. 10(c)(2) of FWPCA).

4/13-14/71 — Convened initial session of Enforcement Conference for *Long Island Sound,* Connecticut-New York, at New Haven, Connecticut.

4/22-23/71 — Reconvened Enforcement Conference on *Lake Superior and its Tributary Basin, Minn-Wis-Mich,* to consider Reserve Mining Co.'s taconite tailings disposal plans, at Duluth, Minnesota.

4/29-30/71 — Held progress meeting of *Potomac River Enforcement Conference, Maryland-D.C.-Virginia,* at Washington, D.C.

5/14/71 — Approved Cleanup program developed by 3/23-24/71 *Lake Michigan Enforcement Conference, Wis-Ill-Ind-Mich.*

5/26/71 — Approved Cleanup program for the *Androscoggin River, New Hampshire-Maine,* growing out of the October 21, 1969 Conference Session.

5/26/71 — Approved Clean-up program for the *Pearl River, Mississippi-Louisiana,* growing out of the November, 1968, Conference Session.

6/7-9/71 — Convened initial session of Enforcement Conference for *Galveston Bay and its tributaries, Texas* (Shellfish Conference, Sec. 10(d) at Houston, Texas.

6/28/71 — Approved Cleanup Program developed for *Dade County, Florida,* at the February, 1971 reconvened Enforcement Conference (See 1 above).

7/71 — Approved Cleanup Program for *Escambia River and Bay, Ala.-Fla.,* as developed by the February, 1971 reconvened Enforcement Conference.

7/2-3/71 — Convened Third Session of Enforcement Conference for *Dade County, Florida,* at Miami, Florida.

7/12/71 — Approved Cleanup Program for the *Merrimack and Nashua Rivers, N.H.-Mass.,* as developed by the October, 1970 reconvened Conference.

8/5/71 — Approved Cleanup Program for *Perdido Bay, Florida-Alabama,* developed at the 2/25/71 reconvened Enforcement Conference.

8/17/71 — Approved remedial program developed during 4/71 reconvened Enforcement Conference on *Lake Superior and its Tributary Basin, Minn.-Wis.-Mich.,* and advised that 180-Day Notice had been served on Reserve Mining Company.

8/24-25/71 — Reconvened 1963 Enforcement Conference on the *Monongahela River, W.Va.-Md.-Pa.* to adopt remedial actions for acid mine drainage and other remaining pollution problems, at Pittsburgh, Pa.

9/21-23/71 — Convened initial Session of the Enforcement Conference (Shellfish) to abate pollution of *Pearl Harbor, Hawaii,* at Honolulu, Hawaii.

9/30-10/1/71 — Convened initial Enforcement Conference on the *Ohio River and its Tributaries* in the *Pittsburgh, Pa. area, (Pa.-Ohio-W.Va.)* to abate pollution in the reach from Pittsburgh to Chester, W.Va. Conference held at Pittsburgh, Pa.

10/1/71 — Approved remedial program developed during 12/8-9/70 Progress Evaluation Meeting of the Enforcement Conference on the *Potomac River, Md.-D.C.-Va.*

10/13/71 — Convened initial Enforcement Conference on the *Ohio River and its Tributaries* in the *Wheeling, W.Va. area (Ohio-W.Va.)* to abate pollution in the reach from Toronto to Shadyside, Ohio. Conference held at Wheeling, W.Va.

10/18/71 — Approved remedial program developed in Third Session (7/2-3/71) of Enforcement Conference for *Dade County, Florida.*

10/19/71 — Convened Enforcement Conference to abate mercury pollution in the waters of *Western South Dakota* (Whitewood Creek-Belle Fourche-Cheyenne River system, from past industrial discharges and natural sources.)

10/27/71 — Reconvened Enforcement Conference on *Boston Harbor and its Tributaries, Mass.*, at Boston, Mass. (Third Session)

11/2/71 — Reconvened Enforcement Conference for *Galveston Bay and its Tributaries, Texas,* to consider recommendations of joint Task Force on technical approach to development of remedial program.

11/10/71 — Approved remedial program developed during 9/30-10/1/71 initial session of the Enforcement Conference on the *Ohio River and its Tributaries in the Pittsburgh, Pa. area (Pa.-Ohio-W.Va.).*

11/10/71 — Approved remedial program developed by 4/71 Conference on *Lake Superior and its Tributary Basin, Minn.-Wis.-Mich.*

11/11/71 — Held progress evaluation meeting of the *Potomac River Conference, Md.-D.C.-Va.*, at Washington, D.C.

11/17/71 — Approved remedial program developed during the Third Session of the 10/27/71 Enforcement Conference on *Boston Harbor and its Tributaries, Mass.*

11/19/71 — Held Progress Evaluation Meeting of the *Dade County, Fla.* Enforcement Conference.

11/29/71 — Approved remedial program developed during the 4/13-14/71 initial session of the Enforcement Conference for *Long Island Sound, Conn.-N.Y.*

12/7-8/71 — Convened initial Enforcement Conference to curb pollution of *Mount Hope Bay, Mass.-R.I.* (Conference called under Shellfish provision of FWPC Act), at Providence, R.I.

12/15/71 — Approved remedial program developed during the 8/24-25/71 Second Session of the Enforcement Conference for the *Monongahela River and its Tributaries, Md.-Pa.-W.Va.*

12/16/71 — Approved remedial program developed during the 9/21-23/71 initial Session of the Enforcement Conference for *Pearl Harbor and its Tributaries, Hawaii.*

12/23/71 — Approved remedial program developed during the 10/19-21/71 initial session of the Enforcement Conference for the navigable waters of *Western South Dakota (Whitewood Creek-Belle Fourche-Cheyenne River System), S.D.*

1/7/72 — Approved remedial program developed during the 11/2/71 session of the Enforcement Conference for *Galveston Bay and its Tributaries, Texas.*

1/6/72 — Reconvened Enforcement Conference on *Mt. Hope Bay, Mass.-R.I.*

1/24-25/72 — Reconvened Enforcement Conference on *Escambia River and Bay, Alabama-Florida*

1/25/72 — Approved remedial program developed during 10/13/71 initial session of the Enforcement Conference on the *Ohio River and its tributaries* in the *Wheeling, W.Va. area (Ohio-W.Va.)* to abate pollution in the reach from Toronto to Shadyside, O.

1/26/72 — Held Progress Evaluation Meeting on *Perdido Bay, Fla.-Ala.*

2/9/72 — Accepted Summary of Progress Evaluation Meeting of 10/5/71 for the Enforcement Conference on the *Potomac River, Md.-D.C.-Va.*, as reconvened 11/11/71, urging timely implementation of Interim Treatment Program.

2/15-17/72 — Convened the Seventh Session of the Enforcement Conference for the interstate waters of the *Colorado River (Calif.-Colo.-Utah-Ariz.-Nev.-N.M.-Wyo.)* to address pollution problems associated with uranium mill tailings piles and increasing river salinity concentrations. Conference was held at Las Vegas, Nevada.

3/22/72 — Convened initial session of Enforcement Conference for the *middle reach of the Savannah River, Ga.-S.C., at Augusta, Georgia.*

4/26-27/72 — Reconvened Seventh Session of the *Colorado River Enforcement Conference (Calif.-Colo.-Utah-Ariz-Nev-N.M.-Wyo.)* to adopt final recommendations for controlling salinity and abating pollution from uranium mill tailings.

6/9/72 — Approved remedial program developed during Seventh Session of the *Colorado River Enforcement Conference* (see entry above).

6/20-21/72 — Held Progress Evaluation Meeting for the Enforcement Conference on the *Potomac River (Md.-D.C.-Va.).*

7/20-21/72 — Reconvened Enforcement Conference on *Lake Michigan and its Tributary Basin (Wis.-Ill.-Ind.-Mich)* to review compliance status.

Appendix C

FEDERAL WATER POLLUTION CONTROL ACT
CASES REFERRED UNDER OIL POLLUTION PROVISIONS[1]
(12-3-70/9-30-72)

Item	Date Referred	Type of Spill	Section of FWPC Act	Referred
PLANTATION PIPELINE COMPANY Athens, Ga.; Case filed	4/20/71	Oil	11(b)(4)	To U.S. Atty.
REVELO CORP., Sanford, Fla. Case filed	10/19/71	Oil	11(b)(5)	To Coast Guard
REFINERY CORP., Commerce City, Colo. (So. Platte R.) Case filed 3/14/72	11/17/71	Oil	11(b)(4)	To U.S. Atty; Fine $5,000 7/72 and 2 yrs. probation ($4,000 suspended)
BERKS ASSOCIATES, INC., Pa. (Schuylkill R.) Case filed	12/71	Oil	11(f)(2)	Pending
C.E. BELL, PLANT MANAGER, MARATHON PIPELINE COMPANY, Birds, Ill. (Embarras River to Wabash River) Case filed 7/28/72	12/6/71	Crude oil	11(b)(4)	To U.S. Atty
HESS OIL COMPANY, Perry County, Miss.; Case filed	12/7/71	Oil	11(b)(5)	To Coast Guard
COLONIAL PIPELINE COMPANY, Beaumont, Tex.; Case filed	12/9/71	Oil	11(b)(5)	
ROGER RODGERS, OWNER, Rodgers Oil Co., Savanna, Ill. (Miss. R.) Case filed on 2/1/72	12/15/71	Oil	11(b)(4)	To U.S. Atty; fine $1000 4/72
MID-CONTINENT PIPELINE CO. Cushing, Okla.; Case filed	1/11/72	Oil	11(e)	To U.S. Atty; pending
CRISPIN COMPANY, Houston, Tex. Miss. River; Case filed	1/31/72	Oil	11(b)(4)	To U.S. Atty; pending
WAYNE BANISTER, FOREMAN, SANDACRES, INC., Woodacres Farm, Seymour, Ind. (Muscatatuek River) Case filed—5/1/72	3/10/72	Oil	11(b)(4)	To U.S. Atty; dismissed by Court 5/19/72; see Table D for suit against Corporation
OTIS AINSWORTH, Yazoo County, Mississippi (Big Black River)	3/15/72	Oil & salt water	11(b)(5)	To U.S. Coast Guard
ALLIED CHEMICAL CO., La. (Bayou Breaux-Miss. River)	3/15/72	Industrial waste	11	To U.S. Atty
CAROLINA MILLS, INC., Newton, N.C. (South Fork of Catawba River)	3/16/72	Oil	11(b)(4)	Fined $500 9/72; case closed
MR. R.Y. LUNSFORD, GULF PIPELINE COMPANY, Trinity River —Liberty County (Texas)	5/9/72	Industrial waste	11(b)(4)	
MR. E. TOMPKINS, LIBERTY SHELL AND MATERIALS COMPANY, Trinity River—Liberty County (Texas)	5/9/72	Industrial waste	11(b)(4)	
R.H.S. CORPORATION, Ellsworth, Me. (Union River)	5/10/72	Oil spill		To U.S. Coast Guard
STEWART D. FENNER, EXECUTIVE VICE-PRESIDENT, PETROLEUM SPECIALTIES, INC., Flat Rock, Mich. (Smith Creek to Huron River)	6/9/72	Fuel oil	11(b)(4)	

[1] Excludes cases referred to U.S. Attorney under Refuse Act, or under both Refuse Act and FWPC Act, Section 11.

Item	Date Referred	Type of Spill	Section of FWPC Act	Referred
R.A. HARTSELLE, DISTRICT ENGINEER, CHICAGO & EASTERN ILLINOIS RAILROAD, Dolton, Ill. (Little Calumet River) Case filed 6/28/72	6/26/72	Oil spills	11(b)(4)	To U.S. Atty
H.P. LUKEHART, DIVISIONAL MECHANICAL OFFICER, CHICAGO AND NORTH WESTERN RAILWAY CO., Minneapolis, Minn. (Bassetts Creek to Miss. River)	6/28/72	Fuel oil discharge	11(b)(4)	
H.E. APPLEGATE, Supt., SOHIO PIPELINE CO., INC., Carmi, Ill. (French Crk to Wabash River)	8/14/72	Oil pipeline leak	11(b)(4)	To U.S. Atty
VOLUNTEER ASPHALT CO., Knoxville, Tenn. (Ft. Loudon Res./Tenn. R.)	9/22/72	Oil and asphalt	11(b)(4) 11(b)(5)	To U.S.C.G.
B&R TRANSPORT CO., Rutherfordton, N.C. (Broad River)	9/29/72	Oil	11(b)(4) 11(b)(5)	To U.S.C.G.; to U.S. Atty
PATRICK PETROLEUM CO., Choctaw Bluff, Ala. (Alabama River)	9/29/72	Crude oil spill	11(b)(5)	To U.S.C.G.

Appendix D

REFUSE ACT[1]
CIVIL CASES REFERRED TO JUSTICE DEPARTMENT BY EPA
(12-3-70/10-18-72)

Item	Date Referred	Case Filed	Status
JONES & LAUGHLIN STEEL CORP., Cleveland, O. (Cuyahoga River) Cyanide, phenols, etc.	12/17/70	12/18/70	Consent decree ent. 12/16/71
ARMCO STEEL CORP., Houston, Tex. (Houston Ship Channel) Cyanide, phenols, etc.	1/15/71	12/9/70	Consent decree ent. 11/4/71
ITT-RAYONIER, Port Angeles, Wash. (Puget Sound) Sulphite waste liquor	1/31/71	3/30/71	Stipulation ent. 3/31/71
KOPPERS CO., Follansbee, W.Va. (Ohio River) Phenols, cyanide	2/17/71	3/24/71	Consent decree in negotiation
NATIONAL STEEL CORP., Weirton, W.Va. (Ohio River) Cyanide	4/21/71	5/11/71	Consent decree in negotiation
WHEELING-PITTSBURGH STEEL CORP., Steubenville, O. (Ohio River) Oil, Cyanide	4/21/71	5/17/71	Pending
CHASE BAG CO., Chagrin Falls, O. (Chagrin River) BOD, suspended solids, dyes	4/21/71	5/17/71	Consent decree filed 10/6/72
ROHM & HAAS, Deer Park, Tex. (Houston Ship Channel) Ammonia, BOD, nickel	5/4/71	7/19/71	Order being drafted
KITCHEN-QUIP, INC., Waterloo, Ind. (Cedar Creek) Chromium, nickel, oil	5/5/71	5/71	Consent decree ent. 10/24/72
GROWERS CO-OP, Westfield, N.Y. (Chatauqua Creek) BOD, color solids	5/6/71	8/9/71	Consent order ent. 11/9/71
SENECA FOODS, Westfield, N.Y. (Lake Erie) BOD, color, solids	5/6/71	8/9/71	Plt. sold to Welch Foods, see entry below
WELCH FOODS, INC., Westfield, N.Y. (Chatauqua Crk, Lake Erie) BOD, color, solids	5/6/71	8/9/71	Consent order 11/9/71
WHEELING-PITTSBURGH STEEL CORP., Follansbee, W.Va. (Ohio River) Phenols	5/7/71	5/17/71	Consent decree negotiation
WHEELING-PITTSBURGH STEEL CORP., Monessen, Pa. (Monongahela R.) Phenols, cyanides, suspended solids	5/7/71	5/17/71	Pending
ALASKA LUMBER & PULP CO., Sitka, Alaska (Silver Bay) Solids, organics	5/17/71	Not filed	—
CLOW CORPORATION, Tarrant, Ala. (Five Mile Creek) Alk. pH, Phenols, oil & grease, solids, etc.	6/2/71	Dropped	—
ALABAMA BY-PRODUCTS, Tarrant, Ala. (Five Mile Creek) Phenols, cyanide, oil & grease, zinc	6/2/71	6/18/71	Consent agreement in preparation
U.S. PIPE AND FOUNDRY CO., Complex, N.E. Birmingham area, Ala. (Five Mile Creek) Phenols, cyanide, metals	6/2/71	6/16/71	Consent agreement in negotiation
McWANE CAST IRON PIPE CO., Birmingham, Ala. (Trib. of Village Creek) Heat, alk. pH, phenols, cyanide, metals, etc.	6/2/71	6/16/71	Technical abatement req'ts under evaluation
U.S. STEEL CORP., Fairfield, Ala. (Opossum Creek) Oil & grease, acid pH, metals	6/2/71	6/14/71	Consent decree ent. 10/19/72
KOPPERS COMPANY, INC., Birmingham, Ala. (Trib. of Opossum Creek) Phenols, cyanide, oil & grease, metals	6/2/71	6/22/71	Consent agreement in negotiation

[1] Section 13 of the River and Harbor Act of 1899.

Item	Date Referred	Case Filed	Status
NASHVILLE BRIDGE, Bessemer, Ala. (Trib. of Valley Creek) Zinc, iron, manganese, lead	6/2/71	6/22/71	Technical abatement req'ts under evaluation
NICK GEORGE, Brattleboro, Vt. (West River) Building materials	6/18/71[2]	6/18/71	Court order issued to remove materials from river
NATIONAL FARMERS ORGANIZATION, Omaha, Nebr. (Missouri River)	8/17/71[2]	Not filed	Prosecution declined
AMERICAN CAN CO., Rothchild, Wis. (Wis. R.) COD, solids, phosphorus	8/27/71		Technical abatement
LAUPAHOE SUGAR CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
HONOKOA SUGAR CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
HAMAKUA MILL CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
PAAHAU SUGAR CO., Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71	10/72	Pending
PEPEEKEO SUGAR CO., Hamakua Coast, (Isld. of Hawaii) North Plant; sugar mill wastes	9/3/71		Pending
PEPEEKEO SUGAR COMPANY, (Hamakua Coast) South Plant; Sugar mill wastes; Hawaii	9/3/71		Pending
HUTCHINSON SUGAR COMPANY, Hamakua Coast, (Isld. of Hawaii) Sugar mill wastes	9/3/71		Pending
MAUNA KEA SUGAR COMPANY, North Plant (Isld. of Hawaii) Sugar mill wastes	9/3/71		Pending
MAUNA KEA SUGAR COMPANY, South Plant, (Isld. of Hawaii) Sugar mill wastes	9/3/71		Pending
IRON OXIDE CORPORATION, Elizabeth, N.J. (Arthur Kill) Lime filter waste	10/21/71[2]	1/7/72	Pending; see Table D for results of criminal charges
CENTRAL RAILROAD OF NEW JERSEY, Raritan, N.J. (Raritan R.) Oil	11/15/71[2]	12/20/71	Consent decree under evaluation
BOROUGH OF EDGEWATER, Edgewater, N.J. (Hudson River) Refuse, shoreside dump	11/24/71[2]		Pending
GEORGIA-PACIFIC CORPORATION, Woodland, Me. (St. Croix River) Logging and paper wastes	11/29/71[2]	1/5/72	Pending
BAYONNE INDUSTRIES, Bayonne, N.J. (Kill Van Kull) Oil discharges	12/8/71[2]		Pending
A. GROSS AND COMPANY, Div. of Milmaster Onyx, Newark, N.J. (Newark Bay) Solids, oil, grease	12/6/71[2]	1/11/72	Abatement req'ts under negotiation
PHELPS-DODGE, Maspeth, N.Y. (Newton Creek) Copper, zinc, acidic, thermal waste	12/22/71[2]		Abatement req'ts under evaluation
CENTRAL STATES PAPER AND BAG COMPANY, Palatka, Fla. (St. Johns River) Paper wastes	12/71	1/72	Case dropped 11/72; pollution abated voluntarily
RESERVE MINING COMPANY (Silver Bay) Minn. Solids, etc.	1/20/72	2/17/72	Pending
POWELL & MINNOCK BRICK WORKS (Subsid. of General Dynamics, Inc.) Coeymans, N.Y. (Hudson River) Oil discharge	2/4/72[2]		Pending
INTERNATIONAL INDUSTRIES, Sayreville, N.J. (Raritan River) Oil discharge	2/4/72[2]		Pending
BIG BLUE RIVER TRASH DUMP (Marjorie White, Owner) Kansas City, Mo.	2/9/72	Not filed	Prosecution declined 6/20/72

[2] Referred by regional office.

Item	Date Referred	Case Filed	Status
CITY OF CARUTHERSVILLE, Mo. (Miss. R.) Land fill dump refuse	2/15/72[2]	Not filed	Pollution stopped; new sanit. fill to be operational by 7/72
CITY OF OSAWATOMIE, Kansas (Marais des Cygnes River) Land fill dump refuse	2/28/72[2]	Not filed	Dump to close 6/1/72; site to be rehabilitated
HOOKER CHEMICAL COMPANY, Industrial Chemicals Division, Niagara Falls, N.Y. (Niagara River) Mercury	3/10/72[2]		
HOUSTON LIGHTING & POWER COMPANY, Texas (Cedar Bayou Trin. Bay) Thermal discharge	3/17/72	3/28/72	Pending in court
HOOVER BALL & BEARING COMPANY, Beatrice, Neb., (Blue River) Acid waste water	3/30/72		Consent order in draft
KAISER REFRACTORIES, Moss Landing, Calif. (Moss Landing Harbor) Trib. of Monterey Bay	4/17/72		
TOWN OF ISLIP, NEW YORK, (Awixa Creek, trib. of Great Cove) Domestic and industrial wastes	4/20/72		
JELLICO INDUSTRIES, INC., (Pickett Company) Tenn. (Holbert Creek) Acid and salt	5/72		
ANAHEIM CITRUS PRODUCTS COMPANY, Yuma, Ariz. (Colorado River) Citrus wastes	5/18/72		Consent decree in negotiation
GROWERS CITRUS PRODUCTS COMPANY, (Colorado River) (Yuma, Ariz.) Citrus wastes	5/18/72		Consent decree in negotiation
CUSTOM CANNERS, Atlanta, Ga. Cannery wastes (Peachtree Creek)	6/1/72	6/9/72	Consent decree ent. 8/25/72
ST. REGIS PAPER COMPANY, Atlanta, Ga. (Paper wastes) (Peachtree Creek)	6/1/72	6/9/72	Consent decree ent. 7/27/72
PAN-PACIFIC FISHERIES, INC., Los Angeles, Calif. (Outer L.A. Harbor) Fish processing wastes	6/9/72	Not filed	Voluntary abatement commitment being drafted
STAR-KIST FOODS, INC., Subsid. of H.J. Heintz Company, Los Angeles, Calif. (2 Plants) Outer L.A. Harbor; Fish processing wastes	6/9/72	Not filed	Same as above
CALIFORNIA MARINE PACKING COMPANY, Division of Westgate-California Foods, Inc. (Los Angeles, Calif.) Outer L.A. Harbor; Fish processing wastes	6/9/72	Not filed	Same as above
VAN CAMP SEAFOODS COMPANY, Division of Ralston Purina Company, Los Angeles, Calif. (Outer L.A. Harbor) Fish processing wastes	6/9/72	Not filed	Same as above
SOUTHWEST CITY, MO., (Cave Springs, Branch) Poultry wastes	6/12/72		
SULLIVANS ISLAND, S.C., Trash and garbage	6/14/72		
AMERICAN CYANAMID, Savannah, Ga. (Acid) (Savannah River)	6/16/72		
CHICAGO AND EASTERN ILLINOIS RAILROAD, Dolton, Ill. (Little Calumet River) Oil	6/27/72	6/29/72	
WHITTAKER CORP. and CITY OF MEMPHIS, TENN. (Mississippi River) Textile wastes	7/6/72	8/18/72	
MOUNTAINEER COAL CO., Fairmont, W.Va. (Trib. of Monongahela R.) Acid mine drainage	7/7/72	7/21/72	
K & W OIL CORP., Casper, Wyo. (North Platte River)	7/7/72	10/72	
TOMS RIVER CHEMICAL CORP., Toms River, N.J. (Atlantic Ocean) Industrial wastes	7/13/72	7/13/72	
FMC CORP., Baltimore, Md. (Baltimore Harbor) Industrial wastes	7/21/72		
NATIONAL MOLASSES, Omaha, Neb. (Missouri River) Molasses refuse	8/3/72	8/10/72	Pending in court

Item	Date Referred	Case Filed	Status
OZARK-MAHONING MINE & MILLING CO. (Pinkham Creek, trib. of North Platte River) Cowdrey, Colo.	8/72	9/6/72	Pending in court
PHILLIPS BOATYARD & LAWRENCE OWENS, Wanchese, N.C. (Croatau Sound) Dredge & fill refuse	8/7/72	8/25/72	Pending in court
SAM BEACHEM, Kitty Hawk, N.C. (Currituck Sound) Dredge & fill refuse	8/7/72	8/25/72	90-day injunction ordered 9/1/72
OWEN FULFORD, Harkers Island, N.C., (Core Sound) Dredge & fill refuse	8/7/72	8/25/72	Injunction ordered 9/1/72 until case heard on merits
CROWN ZELLERBACH CORPORATION, St. Francisville, La. (Mississippi R.)	8/28/72		
GEORGIA PACIFIC CORPORATION, Crossett Division, Port Hudson, La.	9/13/72		
BEAUNIT CORPORATION, Elizabethton, Tenn. (Watauga River) Textile wastes	9/18/72		
BEMBERG INDUSTRIES, INC., Elizabethton, Tenn. (Watauga River)	9/18/72		
AMERICAN CYANAMID COMPANY, Marietta, O. (Ohio River) Ammonia to Marietta STP	9/25/72		
CITY OF MARIETTA, O. (Ohio River) Inadequate treatment of ammonia-bearing wastes from American Cyanamid Company	9/25/72		
CONSOLIDATED PAPER COMPANY, Biron, Wis. Plant (Wisconsin River) Groundwood/paper mill wastes	9/27/72		
CONSOLIDATED PAPER CORPORATION, Whiting, Wis. Plant (Wisconsin River) Groundwood/ paper mill wastes	9/27/72		
CONSOLIDATED PAPER CORPORATION, Wisconsin Rapids, Wis. (Wisconsin River) Paper/ paperboard wastes	9/27/72		
CONSOLIDATED PAPER CORPORATION, Steven Point, Wis. (Wisconsin River) Paper mill wastes	9/27/72		
CONSOLIDATED PAPER CORPORATION, Wisconsin Rapids, Wis. (Wisconsin River) Kraft pulping wastes	9/27/72		
NEKOOSA-EDWARDS PAPER COMPANY, Port Edwards, Wis. (Wisconsin River) Pulp/paper wastes	9/29/72		
NEKOOSA-EDWARDS PAPER COMPANY, Nekoosa, Wis. (Wisconsin River) Pulp/paper wastes	9/29/72		
NEKOOSA-EDWARDS PAPER COMPANY, Whiting-Plover, Wis. (Wisconsin River) Pulp/paper wastes	9/29/72		
GEORGIA-PACIFIC CORPORATION, Tomahawk, Wis. Paper Mill (Wisconsin River) Paper mill wastes	9/29/72		
AMERICAN CAN COMPANY, Rothchild, Wis. (Wisconsin River) Sulfite pulp/paper wastes	9/29/72		
U.S. STEEL CORPORATION, Waukegan Works, Ill. (Lake Michigan) Cooling, rinse & boiler blowdown wastes	10/3/72		
ST. REGIS PAPER COMPANY, Rhinelander, Wis. (Wisconsin River) Sulfite pulp/paper wastes	10/4/72		
MOSINEE PAPER MILLS COMPANY, Mosinee, Wis. (Wisconsin River) Kraft pulp/paper wastes	10/4/72		

Item	Date Referred	Case Filed	Status
PEABODY COAL COMPANY, Vigo County, Ind. (North Coal Creek) Coal refuse piles	10/12/72	10/72	Pending in court
KAISER ALUMINUM AND CHEMICAL CORP. Baton Rouge and Gramercy, La. (Mississippi River)	10/13/72	10/13/72	Consent decree filed simultaneously on 10/13/72

Appendix E

REFUSE ACT[1]
CRIMINAL CASES REFERRED TO JUSTICE DEPARTMENT BY EPA
(12-3-70/10-18-72)

Item	Date Referred	Remarks
JONES & LAUGHLIN STEEL CO., Cleveland, Ohio (Cuyahoga River) Case filed 12/70	12/70[2]	Oil Spill; fined $5,000—2/12/71
U.S. PLYWOOD-CHAMPION PAPER CO., Hamilton, Ohio (Great Miami River) Case filed 12/70	12/17/70[2]	Fish Kill; fined $7,500 on 5/3/71
GEO. W. CREEK, d/b/a GREEK OIL CO., Jacksonville, Fla.; Case filed	4/16/71	Oil Spill
ILLINOIS CENTRAL RAILROAD, Star, Miss. Case filed	4/20/71	Oil Spill
CRYSTAL TISSUE, Middletown, Ohio (Great Miami River) Case filed 8/3/71	4/20/71[2]	Red Paper Dye; Pleaded "nolo" fined / /71
METROPOLITAN PETROLEUM CO., Plattsburgh, N.Y. (Lake Champlain) Case filed 7/6/71	4/28/71[3]	Oil spill; fined $500 and reimbursed U.S. $1,300
B&O RAILROAD, Willard, O. (Jacobs Creek, trib. of Huron River) Case filed 7/30/71	5/5/71[2]	Diesel Fuel Spill; fined $1,000 9/3/71
CHAMPLIN OIL REFINERY, Enid, Okla. (Skeleton Creek) Case filed	5/5/71[2]	Fish Kill; Ammonia
ALASKA LUMBER & PULP CO., Sitka, Alaska (Silver Bay) Case filed	5/17/71[2]	Fish Kill; solids, organics
NEW ENGLAND POWER CO., Somerset, Mass. (Mt. Hope Bay) Case filed	5/21/71	Fish Kill; chlorine
BONA ALLEN, INC, Buford, Ga. Case filed 9/2/71	6/21/71	Pending in Court
BOB MULLIN, d/b/a STINSON HOLLOW BOATYARD, Muscle Shoals, Ala.; Case filed	6/23/71	Oil Spill
ROYAL MANOR HOUSEWARES CO., Los Angeles, Calif.; (Ballona Creek to Santa Monica Bay) Case filed 12/8/71	6/24/71	Cyanide spill; fined $2,000 on 3/6/72
SPEEDWAY WRECKING CO., Chicago, Ill.	7/21/71	Dumping rubble Declined prosecution 12/18/71
BAY CITIES EXCAVATION CO., Montara, Calif.; Case not filed	7/29/71	Prosecution declined
GEORGIA POWER CO., Rome, Ga. (Coosa R.) Case filed 9/2/71	8/26/71	Oil Spill; fined $1,500 on 6/2/72
BULK TERMINALS CO., Chicago, Ill. Case not filed	9/1/71	Dark Liquid; prosecution declined
TABOR CO., La Salle, Ill.	9/1/71	Dumping corn hulls Prosecution declined 2/3/72
INLAND TUGS CO., Jeffersonville, Ind. Case dismissed	9/1/71	Dumping garbage Paid $500 in lieu of rem proceedings
PEABODY COAL CO., Columbia, Mo. (Hinkson Crk. trib. of Mo. River) Case filed	9/14/71	Mine Acid
PHILLIPS PETROLEUM CO., Sedalia, Mo. (Flat Crk., trib. of Mo. River) Case filed	9/14/71	Gasoline spill
ATCHISON COUNTY COOPERATIVE, Rock Port, Mo. (Rock Creek, trib. of Mo. River) Case filed	9/14/71	Ammonia spill
HECK FERTILIZER CO., Mound City, Mo. (Davis Creek, trib. of Mo. River) Case filed	9/14/71	Ammonia spill
JEFFERSON BEACH MARINA CO., Oswego, N.Y. (Lake Ontario) Case filed	9/24/71	Oil spill
NEW DEPARTURES CO., Sandusky O.	9/28/71[3]	Oil spill. Declined prosecution 12/18/71
SHELL CHEMICAL CO., Ventura, Calif. (Ventura River) Case filed 12/8/71	10/1/71	Pleaded "nolo"; fined $5,000 on 1/24/72
MONTROSE CHEMICAL CO., Santa Monica, Case not filed	10/1/71	Prosecution declined
PENNZOIL PRODUCING COMPANY, Tinsley, Miss.; Case filed	10/8/71	Oil spill
MOBIL OIL CORPORATION, Tinsley, Miss.; Case filed	10/8/71	Oil spill
TINKEY FARMS, INC., Harrison Twp, Fulton City, Ind.; Case filed on 2/7/72 (Tippecanoe River)	10/8/71	Fish kill; fined $1,000 on 5/25/72
HAMILTON OIL COMPANY, Evansille, Ind.; case filed	10/8/71	Oil spill; fined $500 on 2/8/72
PALATINE DYEING COMPANY, St. Johnsville, N.Y.; Case filed 5/22/72 (Mohawk River)	10/12/71[3]	Oil spill; fined $500 7/72
AMERICAN OIL COMPANY, Whiting, Ind., (Lake Michigan) Case not filed	10/15/71	Oil spill; Declined prosecution 1/20/72
IRON OXIDE CORPORATION, Elizabeth, N.J. (Arthur Kill) Case filed 6/8/72	10/21/71	Detergent spill; pleaded glty 1 ct. 6/13/72; sentence pends
ROCK ISLAND RAILROAD, Kansas City, Kansas (Kansas River) Case filed 4/12/72	11/9/71	Oil spill; trial set for 9/72; postponed
LIHUE PLANTATION COMPANY, LTD & HAWAII BOARD OF HARBOR COMMISSIONERS, Nawiliwili Harbor, Hawaii; Case filed 11/26/71	11/15/71	Molasses spill; trial for 8/1/72
J.E. BAUER COMPANY, Patoka, Ind. Case filed 1/5/72	12/6/71	Oil spill; fined $500 on 4/28/72
MARATHON PIPELINE COMPANY, Birds, Ill. (Embarass River to Wabash River) Case filed 7/28/72	12/6/71[3]	Oil spill; pending
WESTERN ELECTRIC COMPANY, Omaha, Neb. (Hell Creek, trib. of Papillion River) Case filed 1/28/72	12/7/71	Oil spill; fined $500 on 3/1/72; Consent decree entered
DIAMOND SHAMROCK CHEMICAL COMPANY, Painesville, O. (Grand River) Case filed	12/7/71	Chromium spill; Prosecution declined; previous 15-count criminal suit pending in Court (See Table G)
GETTY PIPE COMPANY, Hazelton, Pa. (Dockwater Creek, trib. of Raritan River) Case filed	12/8/71	Oil spill; pending
RODGERS OIL COMPANY, Savanna, Ill. (Mississippi River) Case field 2/1/72	12/15/71[3]	Oil spill; Refuse Act suit dropped; owner fined under 11(b)4; (See Table H)
AMERICAN SHIPBUILDING COMPANY, Lorain, O. (Black River) Case filed 3/71	12/15/71	Blasting sand; fined $500 on 3/23/72

[1] Section 13 of the River and Harbor Act of 1899.
[2] Referred by EPA headquarters—Washington.
[3] Referred to Justice Department for prosecution under both Refuse Act and FWPC Act, Section 11 (Oil).

Item	Date Referred	Remarks
U.S. STEEL CORPORATION, Gary Works, Gary, Ind.; (Grand Calumet River) Case filed 2/4/72	12/21/71	Oil spill; volun. dismissed due to local prosecution, same offense
GULF OIL COMPANY, Houston, Tex. Case filed	12/28/71	Oil spill
DUVAL SULPHUR COMPANY, Galveston, Tex.; Case filed	1/2/72	Sulphur; pending
INLAND OIL & TRANSPORT COMPANY, St. Paul, Minn. (Mississippi River) Case filed on 1/72	1/10/72	Oil spills (2); fined $500 on 5/5/72
UPPER MISSOURI RIVER CORPORATION, Salix, Iowa (Spill near Red Wing, Minn.)	1/10/72	Gasoline spill; Declined prosecution on 2/28/72
J.F. DONOVAN CONSTRUCTION COMPANY, St. Cloud, Minn.; Case filed	1/11/72	Hot mix plant; soot to air; thence to Lake Superior; declined prosecution 4/18/72
THEODORE ULAND, d/b/a CHEROKEE DRILLING COMPANY, Princeton, Ind. (Yellow Creek to Wabash River) Case filed 3/2/72	1/11/72	Oil field brine; fined $500 on 4/28/72
BARROWS COAL COMPANY, Brattleboro, Vt. (Connecticut River) Case filed 2/72	1/12/72	Oil spill; fined $250 on 3/15/72 for failure to report
TEX-GAS COMPANY, Hayti, (Missouri River) Mo.; Case filed	1/25/72	Oil spill
TEXACO OIL COMPANY, St. Louis, Mo. (Mississippi River) Case filed	1/31/72	Oil spill
FMC CORPORATION, ORGANIC CHEMICALS DIVISION, Baltimore, Md. (Baltimore Harbor) Case filed	2/1/72	Paint solvent (Toluene) discharge Indicted 6/20/72; pld guilty 7/24/72
UNIVERSAL CONTAINER CORPORATION, Marcus Hook, Pa. (Stoney Creek, trib. of Delaware River) Case filed	2/1/72	Oil and grease discharge (pending)
POWELL & MINNOCK BRICK WORKS, (Subsid. of General Dynamics, Inc.) Coeymans, N.Y. (Hudson River) Case filed 2/72	2/4/72[3]	Oil discharge; fined $500 on 3/20/72
INTERNATIONAL INDUSTRIES, Sayreville, N.J. (Raritan River) Case filed	2/4/72	Oil discharge
MID-CONTINENT PIPELINE COMPANY, Cushing, Okla. (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil spill; pending
M-K-T RAILROAD, Oklahoma, (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil spill; pending
KERR-MAGEE REFINERY, Cushing, Okla. (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil spill; pending
MIDLAND COOPERATIVE OIL REFINERY, Cushing, Okla. (Skull Creek, trib. of Cimarron River) Case filed	2/17/72	Oil discharge; pending
OZARK-MAHONING MINING COMPANY, Cowdrey, Colo. (North Platte River) Case filed	2/18/72	Mine-mill wastes; pending
J. BURTON AYRES (Freighter) Lake St. Clair; Case filed	2/23/72	Garbage spill; pending
U.S. STEEL, South Works, Chicago, Ill. (Grand Calumet River) Calumet Harbor; Case filed	2/24/72	Oil spill; pending
CROWN CENTRAL PETROLEUM CORP., Houston, Tex. (Houston Ship Channel)	2/29/72	Oil discharge
ALLIED CHEMICAL COMPANY, Semet-Solvay Division; Detroit, Mich. (Rouge River) Case filed	3/10/72	Tar spill; prosecution declined 4/5/72
SANDACRES, INC., Seymour, Ind. (Vernon Fork of Muscatatuck River) Case filed—5/1/72	3/10/72[3]	Oil spill; pending
CAROLINA MILLS, Newton, N.C.	3/15/72[3]	Oil spills (2)
BUCKEYE PIPELINE COMPANY, Rochester, Ind. (Tippecanoe River) Case filed 5/16/72	3/29/72	Oil spill; fined $1,500 9/1/72
CITIES' SERVICE COMPANY, Fort Meade Mine, Fort Meade, Fla. (Peace River) Case filed 5/11/72	2/9/72	Phosphate Waste
IOWA BEEF PROCESSORS, Dakota City, Neb. (Missouri River)	3/3/72	Indictment 5/9/72; fined $500 9/7/72; Consent decree ent. 9/18/72
MEAD CORPORATION, Chillicothe, O. (City System)	3/6/72	Indictment 7/10/72 Industrial wastes
VILLA d'ORO OLIVE COMPANY, Thermalito, Calif. (Trib. of the Feather River)	3/14/72	Olive wastes; case dropped at EPA request; pollution abated
INLAND CORPORATION, Cleveland, O. (Chippewa Creek) Vermillion River (Case filed 5/16/72)	4/10/72	Gasoline spill; fish-kill; fined $1,000 8/8/72
SPENTONBUSH FUEL TRANSPORT SERVICE, INC., New York, N.Y. (Long Island Sound) off New London, Conn. Case filed 4/18/72	4/10/72	Tanker spill; fined $2,500 5/22/72
YOUNGSTOWN SHEET AND TUBE COMPANY, East Chicago, Ind. (Indiana Harbor Canal)	4/12/72	Suspended solids discharge; case dropped on $1,000 fine for previous offense
HUTCHINSON UTILITIES COMMISSION, Hutchinson, Minn. (South Fork of Crow Creek)	4/12/72	Indictment 6/27/72; Oil spill; fined $1,000 7/14/72
DARLING AND COMPANY, Cleveland, O., (Cuyahoga River) Case filed 5/28/72	4/12/72	Tallow; Case dropped; Fined $500 by Coast Guard on 5/1/72
ALLIED CHEMICAL CORPORATION, Richmond, Calif. (Castro Creek—trib. of San Francisco Bay)	4/13/72	Sulfuric acid wastes; Case dropped; compliance obtained
CITY WIDE ASPHALT, INC., Independence, Mo. (Mill Creek, trib. of Missouri River)	4/17/72	Indictment 5/10/72; fined $500 plus 1-yr probation, 9/7/72
AMALGAMATED SUGAR COMPANY, Twin Falls, Ida. (Rock Creek)	4/20/72	Rupture of a dike
AMERICAN SMELTING AND REFINING COMPANY, Baltimore, Md. (Baltimore Harbor)	4/27/72	Arsenic discharges; 50-count indictment returned 7/11/72
AMERICAN SUGAR REFINING COMPANY, Baltimore, Md. (Baltimore Harbor)	4/27/72	Organic sugar
ALLIED CHEMICAL COMPANY, Baltimore, Md. (Baltimore Harbor)	4/27/72	Chromium discharge; fined $24,000 on 9/12/72
SCM CORPORATION, (Glidden-Durkee Div.) Baltimore, Md. (Baltimore Harbor)	4/27/72	Zinc & cadmium; prosecution declined
NORTON COMPANY, Watervliet, N.Y. Hudson River, Case filed 6/26/72	5/1/72	Oil spill
REPUBLIC STEEL CORPORATION, Cleveland, O. (Cuyahoga River) Case filed 5/8/72	5/5/72	Fined $1000 on 5/17/72; Industrial wastes
U.S. AGRI-CHEMICAL COMPANY, Nashville, Tenn. (Cumberland River) Case filed 6/29/72	5/5/72	Acid; fined $500 7/72
VALLEY OIL COMPANY, Huntington, Mass. (Westfield River—trib. of Connecticut River) Case filed 6/15/72—Pending	5/9/72	#2 fuel oil spill; pending
UNION PACIFIC RAILROAD COMPANY, Pocatello, Ida.	5/15/72	Oil discharge
PBI GORDON CORP., Kansas City, Kans. (Kansas River)	5/4/72	Chemical wastes
HENNINGSEN FOODS, INC., Malvern, Iowa (Silver Creek)—trib. of Missouri River	5/16/72	Wastes, including salmonella; fined $1,000 8/72
VALENTINE FISHERIES, INC., Suamico, Wis. (Big Suamico River)	5/16/72	Indictment 6/14/72; BOD and high coliform counts
TWIN CITY FUEL, INC., Barre, Vt.; (Stevens Branch, Winooski River)	5/17/72	#2 fuel oil spill; pending

Item	Date Referred	Remarks
FARM STORES, INC., (Milk & Ice Cream) Miami, Fla. (58 St. Canal)	5/19/72	BOD and solids; prosecution declined; abatement underway
BUTLER AVIATION, Miami, Fla. (Airport Canal to Tamiami Canal)	5/19/72	Oil; prosecution declined; abatement underway
SKIL CORPORATION, Chicago, Ill., (North Branch of Chicago River) Case filed on 6/28/72	5/25/72	Fuel oil
LEADER CHEESE COMPANY, Reeseville, Wis. (Lau Creek)	5/26/72	Indictment 6/14/72; Wash waters
LOUISVILLE AND NASHVILLE RAILROAD, Evansville, Ind. (Ohio River) Case filed 6/72	5/30/72	Oil
HALQUIST STONE CO. Sussex, Wis. (Sussex Creek)	5/31/72	Indictment 6/14/72; Dissolved & suspended solids and phosphorus
F.R. BUSS AND COMPANY, Caroline, Wis. (Embarras River)	5/31/72	Untreated wastes; Dairy product wastes; Indictment 6/14/72 fined $500 8/7/72
BUCKEYE PIPELINE COMPANY, Rochester, Ind. (Tippecanoe River) Case filed 6/19/72	6/1/72	Oil spill; fined $1,500 9/1/72
MINNESOTA MINING AND MANUFACTURING COMPANY, (3M) St. Paul, Minn., 3M Creek to Mississippi River	6/2/72	Indictment 6/27/72 Phenolic resin; fined $500 10/2/72
DEL OIL AND GAS CORPORATION, Natchez, Miss. (Mississippi River)	6/6/72	Salt water
AMERICAN PETROFINA COMPANY, Natchez, Miss. (Mississippi River)	6/6/72	Oil & salt water
PETROLEUM SPECIALTIES, INC., Flat Rock, Mich. (Smith Creek to Huron River)	6/9/72	Oil
CENTURY ROAD OILING COMPANY, Flat Rock, Mich. (Huron River)	6/9/72	Black waste oil
KAISER REFRACTORIES, Mexico, Mo. (South Fork of Salt River)	6/12/72	Major fish kill, oil spill
FARMLAND FOODS, INC., Garden City, Kans. (Arkansas River)	6/14/72	Fish kill
PEJEPSCOT PAPER COMPANY, Brunswick, Me. (Androscoggin River)	6/23/72	#6 Fuel oil spill
CHICAGO AND EASTERN ILLINOIS RAILROAD, Dolton, Ill. (Little Calumet River) Case filed 6/29/72	6/27/72	Diesel fuel oil spills; prelim. injunction 6/30/72
CHICAGO AND NORTH WESTERN RAILWAY CO., Minneapolis, Minn. (Bassetts Creek to Mississippi River)	6/28/72	Fuel oil spill
BASIC CONSTRUCTION MATERIALS (Subsidiary of Davon, Inc.) Circleville, O. (Scioto River) Case filed 7/72	6/28/72	Concrete mixer wash
INFINGER TRANSPORTATION COMPANY, Charleston Heights, S.C. (Boon's Creek to Lake Keowee)	6/29/72	Oil spill
ALLIED CHEMICAL CORPORATION, Denver, Colo. (South Platte River) Case filed 7/14/72	7/72	Sulfuric acid spill; fish kill; fined $1,500 8/72
K & W OIL CORPORATION, Casper, Wyo. (North Platte River) Case filed 10/72	7/7/72	Oil
PHILLIPS PETROLEUM, Kansas City Refinery, Kans. (Missouri River)	7/20/72	Oil spills (2)
COLLIER DEVELOPMENT CORP., Naples, Fla. (Trib. of Cocohatchee River) Case filed	7/26/72	Garbage
SCOFIELD MARINE CONSTRUCTION, Naples, Fla. (Gulf of Mexico) Case filed 8/14/72	7/26/72	Muck & sludge; fined $500 9/14/72
GENERAL AMERICAN TRANSPORTATION CORP., Carteret, N.J. (Arthur Kill)	8/3/72	Mineral spirits spill 1/27/72; oil spill 2/10/72; Civil relief requested by EPA 8/18/72
J.C. KEETER REALTY CO., Atlantic Beach, N.C. (Bogue Sound) Case filed	8/7/72	Dredge & fill refuse
A & M GENERAL CORP., South Bend, Ind. (Bowman Creek to St. Joseph River)	8/14/72	Diesel fuel spill on 3/27/72
SOHIO PIPE LINE CORPORATION, Carmi, Ill. (French Creek to Wabash R.)	8/14/72	Oil pipeline leak 6/1/72
NATIONAL TRANSIT COMPANY, Oil City, Pa. (Allegheny River) Case filed	8/15/72	Oil spills
AUTOMOTIVE DISPOSAL CORP., Jacksonville, Fla. (Trout River) Case filed 9/11/72	8/25/72	Shredded auto bodies
WYANDOTTE INDUSTRIES CORP., Waterville, Me. (Kennebec River)	9/20/72	Oil spills 3/72 and 7/72
MR. BEN DEHAVEN, Walton, Ind., Frick Transport, Inc., Wawaka, Ind., MR. EUGENE A. SMOLEK, Wawaka, Ind. (Phillips Ditch to Rock Creek to Wabash River) Case filed	9/21/72	Spill of ammonia-bearing liquid; fish kill
UNIROYAL, INC., Chicopee, Mass. (Chicopee River to Connecticut River)	9/24/72	Plasticizer "Paraflux" spills 10/72
WAUMBEC MILLS, INC., Manchester, N.H. (Mernmack River)	9/24/72	Oil seepage for underground tanks
ASHLAND OIL, INC., Evansville, Ind. (Ohio River) Case filed 10/72	9/25/72	Diesel fuel spill 8/26/72
COLT INDUSTRIES-CRUCIBLE, INC., Spring Division, Pittsburgh, Pa. (Allegheny River) Case filed	9/27/72	Oil spill
UNION OIL COMPANY OF CALIFORNIA, Mabscott, W.Va., (Trib. to New River) Case filed	9/27/72	Gasoline spill
REPUBLIC STEEL CORPORATION, Youngstown, Ohio Coke Plant (Mahoning River) Case filed	9/28/72	Coal tar spill 8/7/72
REPUBLIC STEEL CORPORATION, Cleveland, O. (Cuyahoga River)	9/29/72	Susp. solids bypass 6/72; (on breakdown of blast furnaces #5&6 clarifier)
KAISER ALUMINUM AND CHEMICAL CORP. Ravenswood, W.Va. (Ohio River) Case filed	9/29/72	Oil spill
BALTIMORE & OHIO RAILROAD COMPANY, Pittsburgh, Pa. (Monongahela River) Case filed	9/29/72	Oil spill
TRI-W TOWING COMPANY, Greenville, Miss. (Mississippi River) Case filed	10/4/72	Waste liquid discharge from barge 5/20/72 at Hastings, Minn.
WHEELING PITTSBURGH STEEL COMPANY, Yorkville, O. (Ohio River) Case filed	10/4/72	Hexavalent chromium discharge 3/30/72
WHEELING PITTSBURGH STEEL COMPANY, Martins Ferry, O. (Ohio River) Case filed	10/4/72	Industrial waste discharge 5/23 and 6/7/72
PALATINE DYEING COMPANY, St. Johnsville, N.Y. (Mohawk River) Case filed	10/12/72	Oil spill; fined $500 on 7/28/72
ALTON BOX BOARD COMPANY, Lafayette, Ind. (Mouth of Pearl River to Wabash River)	10/16/72	Industrial waste discharge 7/13/72; fish kill
INTERLAKE, INC., Toledo, O. (Maumee River) Case filed	10/16/72	Solids discharge 7/16/72 on blast furnace clarifier breakdown
B.F. GOODRICH COMPANY, Woodburn, Ind. (Maumee River) Case filed	10/16/72	Chemical wastes discharge 9/13/72

Appendix F

REFUSE ACT[1]
CASES REFERRED TO JUSTICE DEPARTMENT FOR NON-FILING OF PERMIT APPLICATIONS
(12-3-70/9-30-72)

Name	Location	Date Referred	Remarks
Armstrong Chemical Co.	Janesville, Wis.	9/24/71	Prosecution declined; file closed
Atlantic Sulphur Terminal, Inc.	Carteret, N.J.	9/24/71	Prosecution declined; file closed
Bancroft Dairy	Marquette, Mich.	9/24/71	No permit req'd; file closed
Basset-Walker Knitting Co.	Basset, Va.	9/24/71	Prosecution declined; file closed
Benton-Harbor Malleable Industries	Benton Harbor, Mich.	9/24/71	Prosecution declined; file closed
Champale, Inc.	Trenton, N.J.	9/24/71	Prosecution req. withdrawn; file closed
Clermont Fruit Packers	Hudson, N.Y.	9/24/71	Civil & crim. filed 12/15/71; fined $12,500 11/72
Crown Prince Pet Foods	North Platte, Neb.	9/24/71	Not prosecuted; file closed; no permit
Denton Sleeping Garments	Centreville, Mich.	9/24/71	Prosecution declined; file closed
D & B Products	Youngstown, O.	9/24/71	Prosecution declined; file closed
Denver & Rio Grande Western Railroad Co.	Roper, Utah	9/24/71	Prosecution declined; permit appl. filed
Diventco, Inc.	New Milford, Conn.	9/24/71	Civil suit filed on 12/1/71; consent decree under negotiation
Eastern Foundry Co.	Boyertown, Pa.	9/24/71	
El Dorado Terminal Corp.	Bayonne, N.J.	9/24/71	Pending
Forest Products Co.	Smelterville, Ida.	9/24/71	Prosecution declined 4/72
Foster Wheeler Corp.	Dansville, N.Y.	9/24/71	Pending
Kaiser Cement & Gypsum Corp.	Delanco, N.J.	9/24/71	Request for prosecution withdrawn
Kennebec River Pulp & Paper	Madison, Me.	9/24/71	Criminal suit filed 10/19/71; fined $500 on 1/7/72
Lisbon Mills, Inc.	Lisbon Falls, Me.	9/24/71	Crim. suit filed 10/19/71
McRae Packing Co.	Edison, Wash.	9/24/71	Prosecution declined; file closed; permit filed
Meadowbrook Coal Co.	Lykens, Pa.	9/24/71	Prosecution request withdrawn; file closed; permit filed
Menominee Enterprises, Inc.	Neopit, Wis.	9/24/71	Prosecution withdrawn; file closed; permit filed
Metals Applied, Inc.	Cleveland, O.	9/24/71	Civil suit filed 10/2/71; case dismissed by court
Moline Malleable Iron Company	St. Charles, Ill.	9/24/71	Prosecution declined; file closed
Northwestern Steel & Wire Company	Sterling, Ill.	9/24/71	Prosecution declined; file closed
Remington Brothers Produce	St. Anthony, Ida.	9/24/71	Prosecution declined; 4/72
Ponce Asphalt Company	Ponce, Puerto Rico	9/24/71	
Schafer Manufacturing Compary	Union City, Mich.	9/24/71	Prosecution declined; file closed
Stockton Cheese Co.	Stockton, Mo.	9/24/71	Civil suit 10/22/71; consent decree ent. 10/22/71; treatment facil. to be installed 2/1/72

[1] Referred to local U.S. Attorney by EPA regional office.

Name	Location	Date Referred	Remarks
Tri-County Growers, Inc.	Monitor, Wash.	9/24/71	Declined prosecution; file closed
Union Pacific Railroad	Salt Lake City, Utah	9/24/71	Civil suit filed 10/12/71
U.S. Steel, Universal Atlas Cement Div.	Cohoes, N.Y.	9/24/71	
U.S. Steel, Universal Atlas Cement Div.	Hudson, N.Y.	9/24/71	Declined prosecution; file closed
U.S. Steel, American Bridge Div.	Trenton, N.J.	9/24/71	Request for prosecution withdrawn
Virginia Iron, Coal & Coke Company	Wise County, Va.	9/24/71	
Hope Valley Dyeing Corp. (EPA Region I)[1]	West Warwick, R.I.	9/24/71	
Vincennes Paper Mill Products Co.[1] (EPA Region V)	Vincennes, Ind.	11/1/71	Crim. suit filed 12/1/71; fined $500 on 6/30/72
Bevin Brothers Manufacturing Co.[1]	East Hampton, Conn.	11/24/71	
Tremont Nail Company[1]	Wareham, Mass.	11/29/71	
Amesbury Metal Products Company, Inc.[1]	Amesbury, Mass.	11/30/71	
Cambridge Tool and Manufacturing Co.[1]	North Billerica, Mass.	12/2/71	
Kay-Dee Feeds[1]	Sioux City, Iowa	11/29/71	Civil suit filed 9/1/72; consent decree filed 9/6/72
Monroe Auto[1]	Cozad, Neb.	11/9/71	
Keokuk Steel Company[1]	Keokuk, Iowa	11/17/71	
Cook Paint & Varnish Company[1]	Kansas City, Mo.	12/17/71	Consent decree pending
GAF Corporation[1]	Kansas City, Mo.	12/71	Pending
Oaks Sand & Gravel Company[1]	Nr. Redding, Calif.	9/17/71	On-site visit 5/72; discharge ceased; no leaching; not prosecuted; file closed
Mid-City Industrial Park[1]	Kansas City, Kan.	1/28/72	Indicted 4/14/72; consent decree in draft
National Beef Packing Corp.[1]	Kansas City, Kans	1/21/72	Indicted 4/13/72; fined $1,000 on 5/72
Connecticut Hard Rubber Co.[1]	New Haven, Conn.	12/29/71	
Kulhman-Chennille Co.[1]	Adairsville, Ga.	1/25/72	
Mecklenberg County and Locker Plant[1]	Charlotte, S.C.	1/25/72	Criminal case filed 6/14/72
A. Leon Capel & Sons[1]	Troy, N.C.	1/25/72	Criminal case filed 4/11/72; fined $500 on 9/72
Pepsi-Cola[1]	Miami, Fla.	1/72	Criminal case filed 1/20/72; fined $6,750 on 3/4/72
Texfi Industries[1]	Mt. Giliad, N.C.	1/25/72	Criminal case filed 4/11/72; fined $500 on 9/72
Tampa Soap & Chemical Company[1]	Tampa, Fla.	1/25/72	Criminal case filed 1/72
Safeway Stores[1]	Kansas City, Kan.	2/4/72	Prosecution declined; tied to city system
Wallace-Murray Corp.[1]	Rolla, Mo.	2/4/72	
Midwest International, Inc.[1]	Kellogg, Iowa	2/4/72	Fined $500 8/72
Carnation Milk[1]	Mt. Vernon, Mo.	2/4/72	Prosecution declined 6/26/62; abatement commitment to be secured
Midwest Cold Storage & Ice Company[1]	Kansas City, Kan.	2/3/72	Indicted 4/14/72; fined $500 8/4/72
Missouri Chemical Corp.[1]	St. Joseph, Mo.	2/2/72	Prosecution declined tied to city system
Wire Rope Corporation of America[1]	St. Joseph, Mo.	2/2/72	Consent judgmt & stipulation ent. 7/19/72

Name	Location	Date Referred	Remarks
Inland Containers Corp.[1]	Fenton, Mo.	2/4/72	Pending
Green Valley Chemical Corporation[1]	Creston, Iowa	2/4/72	Prosecution declined, permit applic. filed
Iowa Fund, Inc.[1]	Ankeny, Iowa	2/4/72	Pending
PPG, Inc.[1]	Crystal City, Mo.	2/9/72	Consent agreement 8/72; $2,500 in costs also assessed
C.F. Industries[1]	Hannibal, Mo.	2/9/72	
Esmond Machine Tool Co.[1]	Rhode Island	3/72	
Central States Paper and Bag Company	Palatka, Fla.	12/71	Pending in court
South Coast Construction Company & Park Lido Development Company	Newport, Calif.	3/23/72	Civil action filed 4/3/72 & temporary restraining order granted same day
E. M. Carter Packing Co.	Richland, N.C.	5/5/72	
Warren Brothers Company	Nashville, Tenn.	5/5/72	
North Carolina Consolidated Hide Company	Goldsboro, N.C.	5/5/72	
Clear Creek Coal Company	Monterey, Tenn.	5/16/72	
The Leisure Group	West Point, Miss.	5/19/72	
Mecklenburg County Abattoir	Charlotte, N.C.	5/24/72	Criminal suit filed 6/14/72
Lefler Concrete Block Company	Charlotte, N.C.	5/24/72	Criminal suit filed 6/15/72
Delmar Printing Company	Matthews, N.C.	5/24/72	Criminal suit filed 6/72 dismissed at EPA request
Chemical Leaman Tank Lines	Charlotte, N.C.	5/24/72	Criminal suit filed 6/15/72
Central Transport, Inc.	Charlotte, N.C.	5/24/72	Criminal suit filed 6/15/72
Snowco (Missouri River)	Omaha, Neb.	7/25/72	Fined $500 8/72
Clinton Engines (Maquoketa R.)	Maquoketa, Iowa	9/18/72	

Appendix G

RECOMMENDATIONS OF WATER POLLUTION CONTROL ADVISORY BOARD

ANIMAL WASTES

EPA Leadership in Animal Waste Pollution Control. It is recommended that EPA assume a vigorous leadership role in coordinating major activities of all Federal, State, and local agencies involved in agricultural waste management with those of educational institutions and private groups and individuals interested in solving animal waste disposal problems. To aid in this effort, EPA must be provided with more funds and expanded staffing to coordinate its own programs in research, training, administration, and management.

Agricultural Concerns. It is recommended that EPA join with the appropriate Federal and State agencies and educational institutions in developing and implementing a comprehensive public information program to explain fully the evolving guidelines and means of achieving effective pollution control measures necessitated by animal waste disposal problems, in recognition of the widespread concern among members of the agricultural community about new and changing requirements.

Financing Pollution Control. It is recommended that EPA seek added appropriations for expanded research and development programs so that costs to the farmer can be held to minimum levels. Demonstration projects are a very effective educational method that should be increased. In addition, USDA should use all existing programs and technical services to help animal producers install systems that comply with regulations.

Degree of Control. It is recommended that EPA encourage the adoption of State legislation and regulations for animal waste management based on minimal Federal guidelines that will maintain standards with a view to enhancing water quality.

Uses of Animal Wastes. It is recommended that EPA give high priority to funding for research and development projects that may develop practicable and safe alternate uses for animal wastes.

Public Health. It is recommended that EPA initiate cooperative long-range research projects that will result in the collection of reliable data on the possible but less evident ill effects of concentrations of animal wastes.

Monitoring. It is recommended that EPA, through program grants or otherwise, encourage State agencies to increase their monitoring programs so that an adequate profile of State water quality by stream basins and groundwater would be available to easily identify problem areas.

Site Selection. It is recommended that attention be given to the development of national and/or State site selection guidelines that will determine the best land areas to be used for animal production to minimize water pollution.

Training. It is recommended that the Federal Government encourage educational institutions and State and local agencies, through grants and/or other incentives, to expand their graduate and undergraduate training programs in the environmental agricultural areas, and thus direct expert manpower into the pollution control field.

Uniformity. It is recommended that EPA develop animal waste guidelines and work as closely as possible with the States to ensure that these basic minimum requirements be adopted nationwide in the interest of uniformity that prevents discrimination against any particular group or individual.

LAND USE

Relationship of Environmental Quality with Land Use Planning and Implementation. The Boards believe that means should be developed to bridge the gap between current land use decision-making and the national efforts to enhance and protect our environment.

Attitudes Toward Land Use. The need to maintain proper land use requires a reappraisal

of private and public land as a resource, as well as a commodity.

Coordination of and Between Federal Agencies. It is recommended that coordination between Federal agencies making land use decisions and other Federal agencies, especially EPA in its role as the Federal agency responsible for laws and standards in the areas of air quality, water quality, solid waste management, and noise. One method of accomplishing these ends is through formal interagency agreements between Federal entities involved in environmental issues.

Role of Federal, State, Regional and Local Government in Land Planning and Implementation. It is recommended that the Federal government provide:

- Land use guidelines including attention to:
  1. Environmental needs in the large, built-up metropolitan areas
  2. The differential costs and benefits for different sectors of the population
  3. Standards to guide State decision-making in an equitable treatment of those costs and benefits
  4. The implementation of effective controls.
- Financial assistance to State and/or regional and local governments for developing and implementing comprehensive land use plans.
- Sanctions applied to States unwilling to carry out effective land use programming.

The States should provide criteria as well as financial and technical assistance to regional and local governments in their land management efforts.

The Environmental Protection Agency's Role in Land Use Planning. It is recommended that:

- EPA move purposefully to improve coordination with other Federal agencies whose activities affect or are affected by air and water quality standards; provide more environmental planning guidance to Federal, State, and local agencies together with close coordination and cooperation with local, regional, and State land use planners and policymakers; and make full use of present authority to affect land use decisions with respect to all environmental quality.
- The Presidents' Air and Water Quality Advisory Boards continue to assess and evaluate the complex relationships between land use and overall environmental quality, and that they define the role of EPA with respect to present land use planning and future possible regional land use policy.

Socio-Economic Considerations. It is recommended that:

- Federal policies and programs on standard setting, grants, contracts, public works, regulation of and investments in Federally owned or controlled lands, and preparation and review of environmental impact statements take into consideration impacts upon population concentration, distribution of resources such as inter-basin water diversions, energy production and distribution, transportation systems, and locations of industrial plants and employment opportunities.
- A socio-economic impact statement covering the above considerations be required as a companion to and equal in importance to present environmental impact statements. In this connection, the Federal agencies concerned should conduct studies of the cost-benefit advantages of such socio-economic planning and control devices (in contrast to the cost effectiveness of the installation of "end of the pipe" control technology).

Pending Legislation Concerning a National Land Use Policy. The Boards commend the President and the Administrator for their support of early enactment of legislation to establish a national land use policy. We believe it imperative that any such legislation be so structured as to require land use plans at all levels of government to be developed from the outset in a manner that will, as a minimum, ensure compliance with applicable environmental laws and standards, including air and water quality standards and implementation plans. In connection with such legislation, the Boards urge that consideration be given to means for direct support of land use planning by those large metropolitan areas that request such support, providing that the requesting agencies can

demonstrate an ability to work within general guidelines consistent with national policies that are provided by the Federal government. If such legislation is enacted, we recommend that the Administrator make the resources of the EPA available to States and local governments to assist (1) in the formulation of land use plans to meet environmental objectives and (2) in the review of plans for consistency with applicable laws before Federal approval.

Information and Education. It is recommended that:

1. The importance of environmental considerations as a part of the planning process be brought to the attention of appropriate officials at all levels of government.
2. An information program be directed toward the general public.
3. Methods be developed that will aid the planner in quantifying the environmental impact of his plan.
4. Better institutional arrangements be developed for decision-makers to participate in the planning process.

Development of Required Scientific Knowledge. It is recommended that the Federal Government and in particular the Administrator of EPA take those steps necessary to assure the development of plans for and the funding necessary to obtain the new scientific knowledge required to determine strategies for dealing with the preservation of our environment.

OCEAN DISPOSAL

Legislation. It is recommended that:

- Congress enact immediately the Marine Protection Research and Sanctuaries Act of 1972 (Ocean Dumping Bill).
- The apparent duplication of responsibilities in EPA and the Department of Commerce for research and monitoring be eliminated and all responsibilities for establishment and enforcement of marine water quality criteria and associated research and monitoring activities be centered in EPA.
- Congress enact immediately the proposed 1972 amendments to the FWPCA as reported by the Joint Senate-House Conference Committee.
- EPA seek remedial legislation to require the establishment of Federal water quality standards for waters in the contiguous coastal zone located between the 3-mile and 12-mile off-shore lines.

Toxic Substances. It is recommended that EPA press for a requirement that all industrial wastes containing significant amounts of toxic substances, including heavy metals, be pretreated for the removal of such substances before being discharged to municipal sewage systems.

Incinerators. It is recommended that EPA actively pursue the development of more accurate emission measuring equipment, so as to provide adequate assurance that sewage sludge incinerators do not pose unacceptable threats to human health or air quality.

Scientific Data. It is recommended that an inventory of the ocean bottom and the coastal waters of the United States and its territories be completed without delay in order to establish baseline data to which future comparisons can be referred. The inventory, or baseline data, should include but not be limited to the subsurface and bottom ocean currents, upwelling, temperatures and chemical composition of the waters, seasonal changes, distribution of existing aquatic life food chains, and aquatic migration patterns.

It is further recommended that EPA take the lead and in cooperation with the National Oceanic and Atmospheric Administration, the Corps of Engineers, Coast Guard and other interested agencies plan and conduct a program of research and monitoring that will lead to improvement of marine water quality criteria, selection and use of ocean dumping sites, provision of guidelines for proposed disposal operations, and assurance of nondegradation and enhancement of the environmental quality of the oceans.

Sludge Disposal on Land. It is recommended that where available Federal or State lands of relatively low value be utilized for experimental sludge-spreading programs.

Dredge Spoils. It is recommended that, where

possible or feasible, dredge spoils should be used to fill coastal land development areas. The Board suggests cost-benefit studies be employed to ascertain the value of environmental enhancement resulting from containment versus dumping of dredge spoil. Studies should also be undertaken to determine the feasibility of treating dredge spoils before ocean disposal to remove solids and other components that might be deleterious to the ecosystems.

Nutrient-Rich Wastes. It is recommended that the Federal government's research activities include efforts to explore more fully those conditions under which nutrient-rich wastes can be effectively utilized to improve the marine environment.

Regional Standards. It is recommended that the Federal government continue to insist on regional approaches and insure consistency in the application of standards of treatment, disposal, and controlled dumping procedures applicable to all State and local agencies in the coastal regions and/or on the river or estuarine system. Separate regional standards must be applied where divergent coastal conditions exist.

Shoreline Protection. It is recommended that State governments intensify their efforts to enhance the quality of their own shoreline and not depend solely on Federal legislation. Federal encouragement of, and priority cooperation with all such States, should hasten the time otherwise required to correct the current abuse of the Nation's coastal waters.

Raw Sewage. It is recommended that the construction of facilities to end the unacceptable practice of discharging raw sewage into any harbor is mandatory. While the Board cannot condone years of failure to comply with acceptable health and welfare standards, it recognizes that funds available to cities have been limited. The Board urges that the construction of sewage treatment plants with sludge digestion be given priority. Federal assistance for such plants must be contingent on EPA approval of the ultimate method of sludge disposal to assure nonviolation of environmental protection regulations—whether disposal is through incineration, marine disposal, land disposal, or other means.

In the absence of an immediate solution to the present practice of raw sewage discharge, a moratorium on new building construction should be enforced to the extent that increased raw sewage discharges and overloading of sewers and treatment plants will not occur.

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